

NEEDHAM PLANNING BOARD

Tuesday, November 28, 2023

7:00 p.m.

Virtual Meeting using Zoom

Meeting ID: **880 4672 5264**

(Instructions for accessing below)

To view and participate in this virtual meeting on your phone, download the “Zoom Cloud Meetings” app in any app store or at www.zoom.us. At the above date and time, click on “Join a Meeting” and enter the following Meeting ID: **880 4672 5264**

To view and participate in this virtual meeting on your computer, at the above date and time, go to www.zoom.us click “Join a Meeting” and enter the following ID: **880 4672 5264**

Or to Listen by Telephone: Dial (for higher quality, dial a number based on your current location):

US: +1 312 626 6799 or +1 646 558 8656 or +1 301 715 8592 or +1 346 248 7799 or +1 669 900 9128 or +1 253 215 8782 Then enter ID: **880 4672 5264**

Direct Link to meeting: <https://us02web.zoom.us/j/88046725264>

1. Discussion of Zoning Strategies for Solar Energy Systems.
2. Minutes.
3. Report from Planning Director and Board members.
4. Correspondence.

(Items for which a specific time has not been assigned may be taken out of order.)

MEMORANDUM

TO: Planning Board

FROM: Lee Newman, Director of Planning and Community Development

DATE: September 16, 2023, last revised November 27, 2023

SUBJECT: **Zoning for Solar Energy Systems**

I am attaching to this memo a draft zoning approach for solar energy systems. Briefly the approach taken defines the types of solar energy systems to be authorized and then establishes a new by-law section for Solar Energy Accessory Uses which names the districts where the use would be permitted and details the terms under which the defined use would be authorized. I have highlighted in the attached zoning approach the key provisions which require further Planning Board policy discussion. A brief overview of the key components found in the zoning approach are below.

1. Key defined accessory uses being permitted are as follows:

Solar Energy System, Active: A solar energy system whose primary purpose is to harvest solar energy into another form of energy or to transfer heat from a collector to another medium using mechanical, electrical, or chemical means. Active Solar Energy Systems include, but are not limited to, the following installation types:

- a. Solar Energy System, Building-mounted: An Active Solar Energy System that is structurally mounted to a building or structure.
- b. Solar Energy System, Roof-mounted: A special application of a Building-mounted Solar Energy System that is structurally mounted to the roof of a building or structure.
- c. Solar Energy System, Ground-mounted: An Active Solar Energy System that is structurally mounted to the ground.
- d. Solar Energy System, Small-Scale Ground-mounted: A Ground-mounted Solar Energy System that occupies 1,750 square feet of surface area or less. (Equivalent to a rated nameplate capacity of about 10 kW DC or less).
- e. Solar Energy System, Medium-Scale Ground-mounted: A Ground-mounted Solar Energy System that occupies more than 1,750 square feet, but less than 40,000 square feet of surface area. (Equivalent to a rated nameplate capacity of about 10 – 250 kW DC).
- f. Solar Parking Canopy: A special application of a Ground-mounted Solar Energy System that is installed on top of a parking surface or paved surface that maintains the function of the area beneath the canopy.
- g. Solar Energy System, Building-integrated Photovoltaic (BIPV): An Active Solar Energy System that consists of integrating solar photovoltaic (PV) modules into the surface of a building or structure, where the solar panels themselves function as, or are integrated into, a building material (i.e., roof shingles, siding, windows, skylights) or structural element (i.e., façade). The generation of solar energy is secondary to the function of the building material or structural element.

- h. Solar Energy System, Surface-integrated: An Active Solar Energy System that is not building-mounted and is integrated into a ground level surface, such as a driveway, walkway, patio surface, path, or parking area, where the solar panels themselves function as, or are integrated into, the surface material. The generation of solar energy is secondary to the function of the surface element.

Solar Energy System, Passive: A Solar Energy System that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

DOER Model By-Law: Definitions used in the draft zoning article follow the DOER Model except that the following additional terms have been added as they were not specifically regulated in the DOER Model. Solar Energy System, Building-mounted; Solar Parking Canopy; Solar Energy System, Building-integrated Photovoltaic (BIPV); and Solar Energy System, Surface-integrated.

2. Named districts where a specified use would be permitted and circumstances where a site plan review would be required.

- a. Roof-mounted Solar Energy Systems would be permitted as-of-right in all use districts.
- b. In residential districts: Small-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies would be permitted as-of-right in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems would be permitted subject to site plan review by the Special Permit Granting Authority.
- c. In nonresidential districts: Small-scale Ground-mounted Solar Energy Systems would be permitted as-of-right in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies would be permitted subject to site plan review by the Special Permit Granting Authority. The same regulations would apply in residential districts for exempted uses as defined by M.G.L. c.40A s.3, or other state and federal statutes, and by the Needham Zoning By-Laws.

DOER Model By-Law:

The DOER model allows roof-mounted solar energy systems, regardless of size, as-of-right throughout the community. The draft zoning approach follows this same standard of as-of-right siting, meaning that such development may proceed without the need for a Special Permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and as such can be built once a building permit has been issued by the building commissioner.

Under the DOER Model for ground-mounted systems, there is a distinction between how small-scale, medium-scale and large-scale systems are treated and where each are allowed as-of-right, via site plan review, or by special permit. The draft zoning follows the same protocol.

The DOER model zoning allows small-scale ground-mounted systems as-of-right throughout the community. These are of a size that would service a house, small businesses, or small municipal building. The draft zoning follows this approach.

The DOER model zoning allows medium-scale ground-mounted systems as-of-right in all districts except residential zoning districts; in these districts Site Plan Review is required. The draft zoning deviates from the DOER model by requiring Site Plan Review for all medium-scale ground-mounted installations in non-residential districts as well as those required in residential districts under the DOER model.

The DOER model zoning requires Site Plan Review for large-scale ground-mounted systems within most zoning districts, a special permit in one residential district, and prohibits such systems in another residential district. Needham's current zoning by-law requires a Special Permit to install a large-scale ground mounted solar facility in a designated and mapped Overlay 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. No change to this current zoning is proposed under this draft zoning approach.

Finally, the draft zoning establishes rules for Solar Parking Canopies which are not addressed in the DOER model as follows: In residential districts: Solar Parking Canopies would be permitted as-of-right in rear and side yards. In nonresidential districts: Solar Parking Canopies would be permitted subject to site plan review by the Special Permit Granting Authority.

3. Lot Coverage

- a. Active Solar Energy Systems are not treated as buildings as defined in the Needham Zoning By-Law. However, for the purpose of regulating lot coverage, the area of Active Solar Energy Systems is counted toward the Maximum Percentage (%) Lot Coverage as defined in the Intensity Regulations provided in the Needham Zoning By-Laws for the affected district.
- b. Active Solar Energy System contribution toward the Maximum Percentage (%) Lot Coverage is calculated as the total area of the system's panels. For example, if a system includes ten (10) panels that are each three (3) feet by five (5) feet, the system's contribution to Maximum Percentage (%) Lot Coverage would equal 150 square feet.
- c. A Building-mounted Solar Energy System or Solar Parking Canopy that extends beyond the impervious area over which it is placed counts toward Maximum Percentage (%) Lot Coverage.
- d. For Ground-mounted Solar Energy Systems the total surface area of the Solar Energy System shall count toward Maximum Percentage (%) Lot Coverage.
- e. To avoid double counting, the surface area of any Active Solar Energy System that is above an existing impervious surface is not included in the calculation of Maximum Percentage (%) Lot Coverage (i.e. the addition of a Roof-mounted Solar Energy System shall not increase the calculated Maximum Percentage Building Coverage on a lot because it will be located within a surface area - the building's footprint - that is already counted).

DOER Model By-Law recognizes that several communities use "maximum lot coverage" or "maximum impervious surface" as one of their dimensional standards. While such features as buildings or driveways would be included in any lot coverage or impervious surface calculation the model by-law recommends that solar systems with grass or another pervious surface under them be exempted from lot coverage or impervious surface calculations. The above noted exemption is not provided in the draft zoning approach.

4. Height for Building-Mounted Solar Energy Systems in all Districts:

- a. Roof Mounted Solar Energy System where roof pitch is greater than or equal to 3.2:12 (a fifteen (15) degree angle)- Roof-mounted Solar Energy Systems may extend up to one (1) foot above the roof surface on which the system is installed beyond applicable building height limits. Systems shall be surface-mounted and installed parallel to the roof surface.
- b. Roof Mounted Solar Energy System where roof pitch is less than 3.2:12 (a fifteen (15) degree angle)- Roof-mounted Solar Energy Systems may extend up to three (3) feet above the roof surface on which the system is installed beyond applicable building height limits. If the surface on which the system is to be mounted is below maximum building height, the Roof-mounted Solar Energy System may extend up to six (6) feet above the roof surface on which the system is installed, provided it does not exceed building height limits by more than three (3) feet; and provided further that any Roof-mounted Solar

Energy System that extends more than three (3) feet above the roof surface on which the system is installed must be installed at least three (3) feet from the roof's edge.

- c. Other Building-mounted Solar Energy System (e.g., awnings)- No greater than the highest point of the roof.

DOER Model By-Law recommends that for purposes of height, roof-mounted solar energy systems should be considered similar to chimneys, television antennae, roof-top mechanical equipment and other appurtenances that are usually either allowed a much higher maximum height (e.g., 100 feet instead of 35 feet) or are exempted altogether from building height requirements. This approach was not followed. Like the approach taken in Natick maximum height standards were established for roof-mounted installations varied by roof pitch and for building mounted installations.

5. Height for Ground-Mounted Solar Energy Systems:

- a. Small-Scale Ground-mounted Solar Energy System in all Districts - Ten (10) vertical feet from grade.
- b. Medium-Scale Ground-mounted Solar Energy System in all Districts - Ten (10) vertical feet from grade.
- c. Solar Parking Canopy in Residential Districts - The maximum height allowed on the lot or the height of the principal structure, whatever is less.
- d. Solar Parking Canopy in Non-Residential Districts – Subject to Site Plan Review by Special Permit Granting Authority.

DOER Model By-Law recommends that existing zoning district height limitations apply for all ground-mounted solar energy systems. If the ground-mounted solar energy system is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply. If the ground-mounted solar energy system is the principal structure on a lot, then the height restriction for principal structures would apply. Needham's zoning by-law does not establish a maximum height for an accessory structure. A standard of 10 feet was applied in the draft zoning for height for both the small scale and medium scale ground mounted systems across all zoning districts. This standard was used in Natick for similar systems. For a Solar Parking Canopy in a residential district the maximum height on the lot or the height of the principal structure, whatever is less, was used. In Non-Residential Districts Solar Canopies are governed by the height requirement of the district.

6. Setbacks

- a. Ground-mounted Solar Energy Systems that move along an axis, unfold, or open shall be located so that the entirety of the equipment's reach at all angles falls within the setback requirements.
- b. Solar Parking Canopies in residential districts shall meet setback requirements for Accessory Structures.
- c. Solar Parking Canopies and Surface-integrated Solar Energy Systems in non-residential zones shall be allowed where parking is permitted in accordance with the requirements defined in Section 5.1.3, Parking Plan and Design Requirements. The requirements for the planting of trees in landscaped strips within the parking area as defined in Section 5.1.3, Paragraphs (k) Landscape Areas and Paragraph (l) Trees should be met elsewhere on the lot.

- d. All other Ground-mounted Solar Energy Systems shall meet requirements for District-level setbacks as defined in the Needham Zoning By-Laws.
- e. Any reach of a Building-Mounted Solar Energy System shall comply with the setback requirements for that building.

DOER Model By-Law recommends for urban communities having required side and rear yard setback standards of 20 feet or less that the existing shorter setback distances should remain for small and medium scale ground mounted solar energy systems. This regulatory framework was implemented in the draft zoning approach.

The DOER Model also recommends that the placement of solar energy systems in front yards should be avoided if possible. The draft zoning approach prohibits such solar energy system installations in the front yard.

7. Supplemental Regulations

- a. BIPV Solar Energy Systems and Surface-integrated Solar Energy Systems shall be subject to any requirements in the Needham Zoning By-Laws that relate to the material or structural element into which the system is integrated or functions as. For example, solar roofing would be subject to regulations for roofing; solar pavement would be subject to regulations for pavement.
- b. The impervious portion of Ground-mounted Solar Energy Systems and Surface-integrated Solar Energy Systems shall be subject to any requirements in the Needham Zoning By-Laws that relate to paving, including impervious lot coverage requirements within the Aquifer Protection District. The systems shall also comply with regulations identified in the Town of Needham's Stormwater By-Law, Article 7 of the General By-Laws.

The DOER Model does not address these systems. The draft zoning approach requires that BIPV Solar Energy Systems and Surface-integrated Solar Energy Systems shall be subject to any requirements in the Needham Zoning By-Laws that relate to the material or structural element into which the system is integrated or functions as. Additionally, the impervious portion of any Ground-mounted Solar Energy Systems and Surface-integrated Solar Energy Systems shall be subject to any requirements in the Needham Zoning By-Laws that relate to paving, including impervious lot coverage requirements within the Aquifer Protection District. The systems shall also comply with regulations identified in the Town of Needham's Stormwater By-Law, Article 7 of the General By-Laws.

8. Section 7.4 Site Plan Review

- a. Site Plan Review is required for all Medium-scale Ground-mounted Solar Energy Systems in all districts and Solar Parking Canopies in non-residential districts. The Planning Board would serve as the Special Permit Granting Authority for these systems.
- b. In addition to the site plan review submittal requirements of Section 7.4 of the Needham Zoning By-law the following additional information is required:
 - 1) Name, address, and contact information for proposed system installer.
 - 2) Name, address, contact information and signature of the project proponent, as well as all co-proponents or property owners, if any.
 - 3) The name, contact information and signature of any agents representing the project proponent.

- 4) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.
- 5) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the Solar Energy System.
- 6) Documentation of the major system components to be used, including the panels, mounting system, and inverter.
- 7) Operation and Maintenance Plan including measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation.
- 8) Locations of active farmland, 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 Massachusetts Department of Environmental Protection (MassDEP) in relation to the site.
- 9) Locations of local or National Historic Districts in relation to the site.

DOER Model limits Site Plan Review of medium-scale ground mounted solar energy systems to residential zoning districts. The draft zoning approach also applies Site Plan Review of medium-scale ground mounted solar energy systems to non-residential zoning districts.

c. In addition to the site plan review criteria and standards of Section 7.4 of the Needham Zoning By-law the following additional criteria is to be considered:

- 1) Utility Notification: No solar photovoltaic system shall be installed until evidence has been given to the Special Permit Granting 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) Utility Connections: Reasonable efforts, as determined by the Special Permit Granting Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.
- 3) Safety: The owner or operator shall provide a copy of the Site Plan Review application to the Needham Fire Department and shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar installation shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.
- 4) Height and Layout: The Special Permit Granting Authority shall also review the height and physical layout of the Solar Energy Systems, utility connections, and appurtenant infrastructure as it relates to the convenience and safety of emergency vehicles, private vehicles and pedestrian movement on the site.
- 5) Visual Impact: Reasonable efforts, as determined by the Special Permit Granting Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.
- 6) Land Clearing, Soil Erosion and Habitat Impacts: Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and By-Laws.
- 7) Lighting: The Special Permit Granting Authority shall review the physical lighting of the site, including the methods of exterior lighting for convenience, safety and security within the site, and in consideration of impacts of neighboring properties and excessive light pollution. Where feasible,

lighting of the Solar Energy System shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

DOER Model By-Law: Criteria used in the draft zoning article follow the DOER Model By-law except that the following additional criteria have been added as they were not specifically regulated in the DOER Model. Height and Layout and Lighting. These provisions are similar to those utilized in Natick.

Solar Energy Systems Zoning Approach

Key Policy Decision Points Highlighted

ARTICLE 1: AMEND ZONING BY-LAW – SOLAR ENERGY SYSTEMS

To see if the Town will vote to amend the Zoning By-Law as follows:

1. In Section 1.3 Definitions, by adding the following term and definition in the appropriate alphabetical location as follows:

“Solar Energy System - a device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage, and distribution of solar energy for space heating or cooling, electricity generation, or water heating. Solar Energy Systems include the following system types:

1. A Solar Energy System, Active: A solar energy system whose primary purpose is to harvest solar energy into another form of energy or to transfer heat from a collector to another medium using mechanical, electrical, or chemical means. Active Solar Energy Systems include, but are not limited to, the following installation types:
 - a) Solar Energy System, Building-mounted: An Active Solar Energy System that is structurally mounted to a building or structure.
 - b) Solar Energy System, Roof-mounted: A special application of a Building-mounted Solar Energy System that is structurally mounted to the roof of a building or structure.
 - c) Solar Energy System, Ground-mounted: An Active Solar Energy System that is structurally mounted to the ground.
 - d) Solar Energy System, Small-Scale Ground-mounted: A Ground-mounted Solar Energy System that occupies **1,750 square feet of surface area or less**. (Equivalent to a rated nameplate capacity of about 10 kW DC or less).
 - e) Solar Energy System, Medium-Scale Ground-mounted: A Ground-mounted Solar Energy System that occupies **more than 1,750 square feet, but less than 40,000 square feet of surface area**. (Equivalent to a rated nameplate capacity of about 10 – 250 kW DC).
 - f) Solar Parking Canopy: A special application of a Ground-mounted Solar Energy System that is installed on top of a parking surface or paved surface that maintains the function of the area beneath the canopy.
 - g) Solar Energy System, Building-integrated Photovoltaic (BIPV): An Active Solar Energy System that consists of integrating solar photovoltaic (PV) modules into the surface of a building or structure, where the solar panels themselves function as, or are integrated into, a building material (i.e., roof shingles, siding, windows, skylights) or structural element (i.e., façade). The generation of solar energy is secondary to the function of the building material or structural element.
 - h) Solar Energy System, Surface-integrated: An Active Solar Energy System that is not building-mounted and is integrated into a ground level surface, such as a driveway, walkway, patio surface, path, or parking area, where the solar panels themselves function as, or are integrated into, the surface material. The generation of solar energy is secondary to the function of the surface element.

Solar Energy System, Passive: A Solar Energy System that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.”

2. Amend Section 6, Special Regulations, by redesignating Subsection 6.2 Boats, Motor Homes and Trailers as Subsection 6.3, by redesignating Subsection 6.3 Filling Stations and Commercial Garages as Subsection 6.4, by redesignating Subsection 6.4 Outdoor Parking of Vehicles as Subsection 6.5, by redesignating Subsection 6.5 Limited Heliports as Subsection 6.6, and by redesignating Subsection 6.6 Complex Developments as Subsection 6.7.
3. Amend Section 6, Special Regulations, by adding a new Subsection 6.2 Accessory Uses – Solar Energy Systems, to read as follows:

“6.2 Accessory Uses – Solar Energy System

6.2.1 Basic Requirements

- a) Roof-mounted Solar Energy Systems shall be permitted in all use districts. The installation of Roof-mounted Solar Energy Systems that:
 - 1) comply with the regulations provided in this section; and
 - 2) are located on properties with nonconforming uses or structures; and
 - 3) do not increase the nonconformity of such nonconforming uses or structures except with respect to the dimensions of the Roof-mounted Solar Energy System in question shall not be considered a change, extension or alteration that requires a finding by the Zoning Board of Appeals per M.G.L. c.40A s.6.
- b) In residential districts: Small-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies shall be permitted in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems shall be permitted subject to site plan review by the Special Permit Granting Authority.
- c) In nonresidential districts: Small-scale Ground-mounted Solar Energy Systems shall be permitted in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted subject to site plan review by the Special Permit Granting Authority. The same regulations shall apply in residential districts for exempted uses as defined by M.G.L. c.40A s.3, or other state and federal statutes, and by the Needham Zoning By-Laws.
- d) Where Solar Energy Systems would be installed in a Historic District, the system shall require approval by the Historic District Commission.

6.2.2 Dimensional Requirement

- a) Maximum Percentage (%) Lot Coverage
 - 1) Active Solar Energy Systems are not buildings as defined in the Needham Zoning By-Law and should not be treated as such. However, for the purpose of regulating lot coverage, the area of Active Solar Energy Systems shall count toward the

Maximum Percentage (%) Lot Coverage as defined in the Intensity Regulations provided in the Needham Zoning By-Laws.

- 2) An Active Solar Energy System's contribution toward Maximum Percentage (%) Lot Coverage shall be calculated as the total area of the system's panels. For example, if a system includes ten (10) panels that are each three (3) feet by five (5) feet, the system's contribution to Maximum Percentage (%) Lot Coverage would equal 150 square feet.
- 3) Such part of a Building-mounted Solar Energy System or Solar Parking Canopy that extends beyond the impervious area over which it is placed shall count toward Maximum Percentage (%) Lot Coverage.
- 4) For Ground-mounted Solar Energy Systems, the total surface area of the Solar Energy System shall count toward Maximum Percentage (%) Building Coverage.
- 5) To avoid double counting, the surface area of any Active Solar Energy System that is above an existing impervious surface shall not be included in the calculation of Maximum Percentage (%) Lot Coverage (i.e. the addition of a Roof-mounted Solar Energy System shall not increase the calculated Maximum Percentage Building Coverage on a lot because it will be located within a surface area - the building's footprint - that is already counted).

b) Height

1) Building-mounted Solar Energy Systems:

System Type	Roof Pitch	Siting	Maximum Height
Roof mounted Solar Energy System	Pitch is greater than or equal to 3.2:12 (a fifteen (15) degree angle)	All districts	Roof-mounted Solar Energy Systems may extend up to one (1) foot above the roof surface on which the system is installed beyond applicable building height limits. Systems shall be surface-mounted and installed parallel to the roof surface.

Roof-mounted Solar Energy System	Pitch is less than 3.2:12 (a fifteen (15) degree angle)	All districts	Roof-mounted Solar Energy Systems may extend up to three (3) feet above the roof surface on which the system is installed beyond applicable building height limits. If the surface on which the system is to be mounted is below maximum building height, the Roof-mounted Solar Energy System may extend up to six (6) feet above the roof surface on which the system is installed, provided it does not exceed building height limits by more than three (3) feet; and provided further that any Roof-mounted Solar Energy System that extends more than three (3) feet above the roof surface on which the system is installed must be installed at least three (3) feet from the roof's edge.
Other Building-mounted Solar Energy System (e.g., awnings)	Not Applicable	All districts	No greater than the highest point of the roof.

2) Ground-mounted Solar Energy Systems:

System Type	Siting	Maximum Height
Small-Scale Ground-mounted Solar Energy System	All districts	Ten (10) vertical feet from grade.
Medium-Scale Ground-mounted Solar Energy System	All districts	Ten (10) vertical feet from grade.
Solar Parking Canopy	Residential	The maximum height allowed on the lot or the height of the principal structure, whatever is less.
Solar Parking Canopy	Non-residential	Subject to site plan review by Special Permit Granting Authority.

c) Setbacks

- 1) Ground-mounted Solar Energy Systems that move along an axis, unfold, or open shall be located so that the entirety of the equipment's reach at all angles falls within the setback requirements.
- 2) Solar Parking Canopies in residential districts shall meet setback requirements for Accessory Structures.
- 3) Solar Parking Canopies and Surface-integrated Solar Energy Systems in non-residential zones shall be allowed where parking is permitted in accordance with the requirements defined in Section 5.1.3, Parking Plan and Design Requirements. The requirements for the planting of trees in landscaped strips within the parking area as defined in Section 5.1.3, Paragraphs (k) Landscape Areas and Paragraph (l) Trees should be met elsewhere on the lot.
- 4) All other Ground-mounted Solar Energy Systems shall meet requirements for District-level setbacks as defined in the Needham Zoning By-Laws.
- 5) Any reach of a Building-Mounted Solar Energy System shall comply with the setback requirements for that building.

6.2.3 Supplemental Regulations

- a) BIPV Solar Energy Systems and Surface-integrated Solar Energy Systems shall be subject to any requirements in the Needham Zoning By-Laws that relate to the material or structural element into which the system is integrated or functions as. For example, solar roofing would be subject to regulations for roofing; solar pavement would be subject to regulations for pavement.
- b) The impervious portion of Ground-mounted Solar Energy Systems and Surface-integrated Solar Energy Systems shall be subject to any requirements in the Needham Zoning By-Laws that relate to paving, including impervious lot coverage requirements within the Aquifer Protection District. The systems shall also comply with regulations identified in the Town of Needham's Stormwater By-Law, Article 7 of the General By-Laws.

6.2.4 Site Plan Review

- a) Site Plan Review: Medium-scale Ground-mounted Solar Energy Systems in all districts and Solar Parking Canopies in non-residential districts are subject to site plan review by the Special Permit Granting Authority prior to construction, installation or modification as provided in this section and in accordance with Section 7.4 Site Plan Review. The Planning Board will serve as the Special Permit Granting Authority for these systems.
 - 1) Site Plan Document Requirements: The project proponent shall provide a Final Site Plan to the Special Permit Granting Authority in compliance with Section 7.4 Site Plan Review, Subsection 7.4.4.Procedure. In addition, applicants should submit the following:
 - i. Name, address, and contact information for proposed system installer.
 - ii. Name, address, contact information and signature of the project proponent, as well as all co-proponents or property owners, if any.

- iii. The name, contact information and signature of any agents representing the project proponent.
 - iv. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.
 - v. Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the Solar Energy System.
 - vi. Documentation of the major system components to be used, including the panels, mounting system, and inverter.
 - vii. Operation and Maintenance Plan including measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation.
 - viii. Locations of active farmland, 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 Massachusetts Department of Environmental Protection (MassDEP) in relation to the site.
 - ix. Locations of local or National Historic Districts in relation to the site.
- b) Site Plan Review Design Standards: The Special Permit Granting Authority shall consider the following criteria and standards, in addition to those listed in Section 7.4.6, Review Criteria for Site Plan Review when reviewing site plan submittals made under this section:
- 1) Utility Notification: No solar photovoltaic system shall be installed until evidence has been given to the Special Permit Granting 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) Utility Connections: Reasonable efforts, as determined by the Special Permit Granting Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.
 - 3) Safety: The owner or operator shall provide a copy of the Site Plan Review application to the Needham Fire Department and shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar installation shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

- 4) Height and Layout: The Special Permit Granting Authority shall also review the height and physical layout of the Solar Energy Systems, utility connections, and appurtenant infrastructure as it relates to the convenience and safety of emergency vehicles, private vehicles and pedestrian movement on the site.
- 5) Visual Impact: Reasonable efforts, as determined by the Special Permit Granting Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.
- 6) Land Clearing, Soil Erosion and Habitat Impacts: Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and By-Laws.
- 7) Lighting: The Special Permit Granting Authority shall review the physical lighting of the site, including the methods of exterior lighting for convenience, safety and security within the site, and in consideration of impacts of neighboring properties and excessive light pollution. Where feasible, lighting of the Solar Energy System shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.”

Or take any other action relative thereto.

Model Zoning for the Regulation of Solar Energy Systems¹
Department of Energy Resources
Massachusetts Executive Office of Energy and Environmental Affairs
December 2014

This model zoning and accompanying Guidance were prepared to assist Massachusetts cities and towns in establishing reasonable standards to facilitate development of solar energy systems. These systems include small-, medium- and large-scale as well as both ground-mounted and roof-mounted installations.² The model zoning language provided here is not intended for adoption precisely as it is written. Communities will need to carefully consider how this language may be modified to suit local conditions and where it should be inserted into an existing Zoning Bylaw/Ordinance. Further, it is highly recommended that any language adapted from this model be reviewed by municipal counsel prior to adoption.

As small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems become more prevalent in Massachusetts, many communities are attempting to regulate the installation of these systems through their Zoning Bylaw/Ordinance. Developing these regulations has been particularly challenging for a number of reasons. Most notably, the Massachusetts General Laws contains several provisions that specifically address the ability of local governments to regulate solar energy systems and/or to protect solar access from development or vegetation (shading) on adjacent properties. While the language within Chapter 40A Section 3 states that a local government may not prohibit these uses, it does say they cannot be “unreasonably regulated” without providing guidance on what that particular phrase means. The Solar Energy Systems Policy Guidance, which accompanies this model zoning and succeeding sections of this document provide more explanation regarding the implications of the statutes on this issue and its significance to local zoning.

Unlike model bylaws/ordinances typically developed by the Commonwealth, the regulatory language provided here is not packaged as a “stand-alone” section of a Zoning Bylaw/Ordinance. With ground-mounted and roof-mounted solar energy systems, the statutory framework and “accessory” nature of some of these installations lend themselves to a different approach. This model zoning therefore assumes that municipalities will have many “typical” sections within their Zoning Bylaw/Ordinance and that several of these sections would be amended to address this issue. For the purposes of this model zoning, the Bylaw/Ordinance sections that are amended include:

¹ This material is based upon work supported by the U.S. Department of Energy under Award Number DE-EE0005692. This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

² This material was prepared by the Horsley Witten Group.

*The Definitions Section;
Allowable Uses;
Dimensional Requirements; and
Site Plan Review.*

There is also further discussion intended to help communities regulate these systems in the context of a Local Historic District.

Definitions

Commentary: Within a Zoning Bylaw/Ordinance, the Definitions Section usually stands alone. Definitions are also sometimes included as a sub-section within other sections of the Zoning Bylaw/Ordinance. For example, terms related to the protection of water resources may be included in a water resource protection overlay district section. We recommend that the following terms be added to the general Definitions Section of the Zoning Bylaw/Ordinance.

Photovoltaic System (also referred to as Photovoltaic Installation): An active solar energy system that converts solar energy directly into electricity.

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

Solar Access: The access of a solar energy system to direct sunlight.

Solar Collector: A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy.

Solar Energy: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Commentary: While it is anticipated that installed solar energy systems will most frequently be photovoltaic, this model zoning uses the statutory definition of a solar energy system, which is broader and permits the installation of solar thermal systems as well.

Solar Energy System: A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.

Solar Energy System, Active: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.

Solar Energy System, Grid-Intertie: A photovoltaic system that is connected to an electric circuit served by an electric utility.

Solar Energy System, Ground-Mounted: An Active Solar Energy System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale).

Solar Energy System, Large-Scale: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).

Solar Energy System, Medium-Scale: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC).

Solar Energy System, Off-Grid: A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility.

Solar Energy System, Passive: A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

Solar Energy System, Roof-Mounted: An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale).

Solar Energy System, Small-Scale: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).

Solar Thermal System: An Active Solar Energy System that uses collectors to convert the sun's rays into useful forms of energy for water heating, space heating, or space cooling.

Use Regulations

Commentary: Within a Zoning Bylaw/Ordinance, the Use Regulations describe which land uses are allowed within different zoning districts of the community, and which permits are required. The Use Regulations typically include a Use Table and/or a narrative description of the principal and accessory uses that are allowed, prohibited and/or allowed only through a Special Permit within each zoning district.

Pursuant to Chapter 40A Section 3, a Massachusetts municipality may not prohibit or unreasonably regulate solar energy systems except where necessary to protect public health, safety or welfare. Therefore, 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, as drafted this model zoning 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. These provisions are described in more detail in the following sections. A more detailed discussion of DOER's understanding of Chapter 40A Section 3 is provided in the Policy Guidance for Regulating Solar Energy Systems that serves as a companion piece to this regulatory guidance.

As a cautionary note, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on materials, setbacks or height, and other similar items, as related to aesthetics, can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3.

Two examples are provided in this section for how roof-mounted, small-scale ground-mounted, medium-scale ground-mounted, and large-scale ground-mounted solar energy systems can be incorporated into a municipality's Use Regulations. In these examples, roof-mounted solar energy systems, regardless of size, are allowed as-of-right throughout the community. As-of-right siting means that development may proceed without the need for a Special Permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and can be built once a building permit has been issued by the inspector of buildings, building commissioner or local inspector.

For ground-mounted systems, there is a distinction between how small-scale, medium-scale and large-scale systems are treated and where each are allowed as-of-right, via site plan review, or by special permit. The model zoning allows small-scale ground-mounted systems as-of-right throughout the community. These are of a size that would service a house, small businesses, or small municipal building.

The model zoning allows medium-scale ground-mounted systems as-of-right in all districts except residential zoning districts; in these districts Site Plan Review is required. This means that medium-scale ground-mounted systems cannot be prohibited, and that DOER considers Site Plan Review reasonable regulation. Site Plan Review is discussed in more detail later in this document, but in general it establishes criteria for the layout, scale, appearance, safety, and environmental impacts of certain types and/or scales of development. Typically, site plan approval must be obtained before the building permit is issued. Since medium-scale ground-mounted systems can reach up to approximately an acre in size, DOER believes it is reasonable and appropriate to provide more regulatory scrutiny via Site Plan Review for these projects in residential districts to protect public health, safety, or welfare.

As drafted, the model zoning requires Site Plan Review for large-scale ground-mounted systems within most zoning districts, a special permit in one residential district, and prohibits such systems in another residential district. However, communities should remember that the language of the zoning exemption for solar energy systems is imprecise. While some communities already require a Special Permit to install a large-scale ground mounted solar facility, and/or

restrict them to certain districts, it is not clear whether these regulations are consistent with the Chapter 40A Section 3 mandate that they be reasonable and necessary to protect public health, safety, or welfare.

Connection to the Massachusetts Green Communities Designation and Grant Program

Recognizing the uncertainty around how regulations may or may not be interpreted as reasonable, DOER allows communities to meet Green Communities Criterion One by zoning for the as-of-right installation of a solar facility of at least an acre in size in a designated location. For more information on the Green Communities Designation and Grant Program, please visit: <http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/>.

Siting Preferences

Where a solar facility is sited, as well as placement on the site once selected, is an important consideration, particularly in regard to large-scale ground mounted facilities. DOER strongly discourages locations that result in significant loss of land and natural resources, including farm and forest land, and encourages rooftop siting, as well as locations in industrial and commercial districts, or on vacant, disturbed land. Significant tree cutting is problematic because of the important water management, cooling, and climate benefits trees provide.

In regard to farm properties, rooftops are preferable. If roof space is inadequate non-productive, non-arable agricultural land is the second choice. Should this also prove infeasible or inadequate a dual use of land design concept could preserve productive farmland by continuing crop production underneath high-mounted and well spaced panels. Finally, if none of these are feasible or they are inadequate the least productive land should be used first to minimize the loss of productive food/crop land.

Overlay Zoning Districts

Overlay zoning districts are one zoning approach that could be used to permit solar energy systems, and in ways not allowed under the base zoning districts. For example, the model zoning as drafted requires Site Plan Review for medium-scale ground mounted solar energy systems in residential districts. An overlay district could be used to permit such facilities without Site Plan Review in a portion of these residential districts where Site Plan Review is deemed unnecessary, while retaining the review for the balance of the districts.

In addition, some communities may wish to conduct a feasibility analysis to determine where large-scale solar energy systems are most appropriate within the municipality and use an overlay zoning district approach to encourage the siting of facilities in the most feasible locations. Once an area has been established through a thoughtful and analytical process, the municipality could enact overlay zoning legislation to prioritize these areas for large-scale solar energy systems. Many Massachusetts communities have already taken this approach through adoption of a large-scale ground-mounted solar overlay district, often based on DOER's [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#).

Agricultural Exemption:

In addition to the exemption pertaining to solar energy systems Section 3 of Chapter 40A also exempts agricultural uses from zoning regulations that would otherwise apply. Thus, when the majority of the power from a solar energy system (or a wind turbine) is integral to farm production construction and operation of the system would covered by the exemption. Questions on the applicability of the agricultural exemption to solar energy systems should be directed to Gerry Palano at the Dept. of Agricultural Resources (Gerald.Palano@state.ma.us or 617-626-1706).

Example 1 (Use Tables):

	Residential-1 (R1)	Residential-2 (R2)	Residential-3 (R3)	Commercial (C)	Industrial (I)	Public (P)
<u>PRINCIPAL USE</u>						
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y
Large-Scale Ground-Mounted Solar Energy System	SP	N	SPR	SPR	SPR	SPR

Y = Allowed

SP = Special Permit

N = Prohibited

SPR = Site Plan Review

	Residential-1 (R1)	Residential-2 (R2)	Residential-3 (R3)	Commercial (C)	Industrial (I)	Public (P)
<u>ACCESSORY USE</u>						
Roof-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Small-Scale Ground-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y

Y = Allowed

SP = Special Permit

N = Prohibited

SPR = Site Plan Review

Example 2 (Uses listed):**1.0 Residential District Uses****1.1 Uses Permitted****1.1.1 Roof-Mounted Solar Energy Systems****1.1.2 Small-Scale Ground-Mounted Solar Energy Systems**

1.2 Uses Allowed through Site Plan Review

- 1.2.1 Medium-Scale Ground-Mounted Solar Energy Systems
- 1.2.2 Large-Scale Ground-Mounted Solar Energy Systems in the R3 District

1.3 Uses Allowed via Special Permit

- 1.3.1 Large-Scale Ground-Mounted Solar Energy Systems in the R1 District

2.0 Non-Residential District Uses

2.1 Uses Permitted

- 2.1.1 Roof-Mounted Solar Energy Systems
- 2.1.2 Small-Scale Ground-Mounted Solar Energy Systems
- 2.1.3 Medium-Scale Ground-Mounted Solar Energy Systems

2.2 Uses Allowed through Site Plan Review

- 2.2.1 Large-Scale Ground-Mounted Solar Energy Systems

Dimensional Regulations

Commentary: In most cases, the existing dimensional standards in a Zoning Bylaw/Ordinance will allow for the development of small-, medium-, and large-scale solar energy systems. However, if a municipality finds alternate dimensional standards are necessary to allow solar energy systems while protecting public health, safety, or welfare, it may impose them. As a reminder, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on dimensional standards, such as setbacks or height, as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems due to the strong statutory protections in Chapter 40A Section 3, or that they do so very carefully.

With regard to more basic dimensional requirements such as setbacks from the property line, municipalities may also find that adjustments can be made to encourage broader use of solar energy systems. Below is a series of dimensional regulation amendments that a municipality could adopt to further encourage small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems, or simply clarify requirements pertaining to them.

Height

Commentary: It is recommended that for purposes of height, roof-mounted solar energy systems should be considered similar to chimneys, television antennae, roof-top mechanical equipment and other appurtenances that are usually either allowed a much higher maximum height (e.g., 100 feet instead of 35 feet) or are exempted altogether from building height requirements. Such

an exemption can be stated in the definition of “Building Height” or through language similar to that provided in the following example.

It is recommended that existing zoning district height limitations apply for all ground-mounted solar energy systems. If the ground-mounted solar energy system is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply. If the ground-mounted solar energy system is the principal structure on a lot, then the height restriction for principal structures would apply.

Example:

1.0 Building Height Regulations

1.1 Exemptions

1.1.1 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

Commentary: It is recommended that small- and medium-scale ground-mounted solar energy systems that are accessory to a primary building or structure on a lot be provided with more flexible setback requirements than those that would typically apply to a primary structure. Many communities already provide some flexibility for “accessory structures” like sheds, allowing these to be closer to the lot line than the primary structure. For example, where a front/side/rear yard setback for the primary structure may be 50 feet, setbacks of 20 feet may be allowed for accessory structures. When ground-mounted solar energy systems are developed as accessory structures to a home, business or other building or structure, they should be afforded at least the same flexibility.

If a community does not have this type of reduced setback already built into the Zoning Bylaw/ Ordinance, a provision could be added that effectively reduces the setback distance just for this use. For example, if the community has a dimensional table, a special footnote could be added to the dimensional table as indicated in the following examples. It should be noted that often times there is a distinction between how accessory structures are regulated in a residential zoning district and how they are regulated in a commercial or industrial district. Therefore, communities should ensure that provisions for flexible setbacks for small- and medium-scale ground-mounted solar energy systems are incorporated wherever appropriate.

The first example applies a reduction of 50% to the otherwise required setbacks for accessory uses. The value of 20 feet is used in the second example; however, this may be altered based on local conditions. For example, in some communities, particularly urban communities, the required side- and rear-yard setback distances may be shorter than 20 feet. In these

circumstances, the existing shorter setback distances should remain for small- and medium-scale ground-mounted solar energy systems.

As opposed to small- and medium-scale ground-mounted solar energy systems, which are typically sited as accessory to a principal building or structure on a lot, large-scale ground-mounted solar energy systems are usually sited as principal structures. Whenever a solar energy system is sited as a principal structure on a lot, it is recommended that the setback requirements for principal structures in that zoning district apply. Regardless of the scale of the system or the minimum setback required solar energy system installers often allow a sufficient setback to avoid the issue of shading by vegetation on neighboring properties.

Placement of solar energy systems in front yards should be avoided if at all possible. However, in DOER's view the statutory protections for solar energy systems create a situation where a ground-mounted array could not be prohibited outright in a front yard, so the language provided in the following example includes a standard for the front yard setback. DOER recognizes the concerns this may raise in residential neighborhoods and acknowledges that communities should work with property owners to find appropriate locations for ground-mounted systems in side or rear yards.

Example Dimensional Table Footnotes for Accessory Installations:

- (1) Small- and medium-scale ground-mounted solar energy systems 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
- (2) Small- and medium-scale ground-mounted solar energy systems accessory to a principal use may be located no closer than [twenty (20) feet] 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.

Lot Coverage

Commentary: A number of communities use "maximum lot coverage" or "maximum impervious surface" as one of their dimensional standards. While it is clear that such features as driveways or buildings would be included in any calculation of lot coverage, many other features may be more ambiguous depending on how clearly the definition in the Zoning Bylaw/Ordinance is written. Awnings, porches, decks and similar features can often become a matter of dispute. Regardless of the definition, it is recommended that solar energy systems with grass or another pervious surface under them be exempted from lot coverage or impervious surface calculations. If the area is to be paved or otherwise rendered impervious then this land area should in fact count toward any coverage or impervious surface limit. It is also important to note that this recommended exemption is not intended to apply to municipal stormwater regulations, as the panels could have the effect of altering the volume, velocity, and discharge pattern of stormwater runoff. The following provision could be included as a footnote to the Dimensional Table related

to maximum lot coverage and impervious cover requirements, or as a separate provision within the dimensional regulations.

Example:

Solar energy systems shall not be included in calculations for lot coverage or impervious cover as defined in [INSERT SECTION REFERENCE FOR ‘DEFINITIONS’].

Site Plan Review Requirements and Performance Standards

Commentary: Although not specifically addressed under Chapter 40A, Site Plan Review is included within the local Zoning Bylaws/Ordinances of many Massachusetts communities. Site Plan Review is meant to enforce clear and fair design standards for different types of development. This is typically done through a coordinated review process that circulates development applications among, and invites input from, all local boards and commissions that might permit a project, including Local Historic District Commissions as applicable. Site Plan Review is usually triggered by either specific types of uses (e.g., commercial or industrial development), or certain scales of uses (e.g., non-residential buildings over 5,000 square feet).

Typically, Site Plan Review procedures and requirements are provided within a separate section of the Zoning Bylaw/Ordinance. However, there are instances when communities provide separate Site Plan Review provisions and procedures within a section pertaining to a particular use or development type (e.g., Planned Business Development, etc.). Consistent with the Legislature’s intent to facilitate the siting of solar energy, communities should shape the Site Plan Review provisions of their Zoning Bylaws/Ordinances to enable large-, medium- and small-scale solar energy system projects to proceed without undue delay.

Model language for Site Plan Review for medium-scale ground-mounted solar energy systems is provided in the following Example 1. As discussed earlier in this document, Site Plan Review may be appropriate when medium-scale ground-mounted systems are sited within residential districts. The model language provided in Example 1 below is based on, but is less stringent than, the provisions in the Massachusetts DOER [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#).

Example 2 provides model language for Site Plan Review for large-scale ground-mounted solar energy systems when they are permitted as of right. As discussed earlier in this document, Site Plan Review may be appropriate for large-scale ground-mounted systems when they are sited anywhere within the community. The model language provided in Example 2 below is based on the provisions in the Massachusetts DOER [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#). Example 2 is also intended for use in concert with the special permit language in the next section of this model zoning.

Example 3 provides model language for roof-mounted and small-scale ground-mounted systems when they are part of a larger project where Site Plan Review is triggered through another threshold (e.g., commercial development, non-residential buildings over 5,000 square feet, etc.). It is important to note that the installation of roof-mounted or small-scale ground-mounted solar

energy systems does not trigger Site Plan Review on its own. However, when such systems are included as part of a larger development proposal that requires Site Plan Review, the municipality has the opportunity to review the roof-mounted or small-scale ground-mounted solar energy systems as part of the larger proposal.

As discussed earlier in this document, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on solar energy systems as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3. However, where communities already have Site Plan Review standards that relate to aesthetics, such as screening requirements, these standards should also apply to solar energy systems. In other words, solar energy systems should not be singled out and regulated more stringently than other uses that require Site Plan Review; however, they can be held to the same level of restrictions that are in place for other uses.

Example 1 (Site Plan Review provisions for medium-scale ground-mounted solar energy systems in residential zoning districts):

1.0 Site Plan Review

1.1 Applicability

- 1.1.1 Medium-scale ground-mounted solar energy systems proposed within residential zoning districts shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

- (a) Property lines and physical features, including roads, for the project site;
- (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- (c) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;

- (d) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
- (e) Name, address, and contact information for proposed system installer;
- (f) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- (g) The name, contact information and signature of any agents representing the project proponent; and
- (h) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

- (i) *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.*
- (j) *Locations of floodplains or inundation areas for moderate or high hazard dams;*
- (k) *Locations of local or National Historic Districts;*

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

Commentary: Provision 1.2.2 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.

1.3 Site Plan Review Design Standards

1.3.1 Standards for medium-scale ground-mounted solar energy systems proposed within residential zoning districts

- 1.3.1.1 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.

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

1.3.1.3 Safety - The medium-scale ground-mounted solar energy system owner or operator shall provide a copy of the Site Plan Review application to the local fire chief. All means of shutting down the solar installation shall be clearly marked.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for medium-scale solar energy systems should be aware of any unique local requirements that could apply. For example, if the fire department will want an Emergency Response Plan as part of approval, this should be folded into the review process as seamlessly as possible.

1.3.1.4 Visual Impact – Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.

1.3.1.5 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

Commentary: As drafted, this model zoning does not require medium-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 2 (Site Plan Review provisions for large-scale ground-mounted solar energy systems):

1.0 Site Plan Review

1.1 Applicability

1.1.1 Large-scale ground-mounted solar energy systems shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

- (a) Property lines and physical features, including roads, for the project site;
- (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- (c) Blueprints or drawings of the solar energy system signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;
- (d) One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all Massachusetts Electric Code (527 CMR 12.00) compliant disconnects and overcurrent devices;
- (e) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
- (f) Name, address, and contact information for proposed system installer;
- (g) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- (h) The name, contact information and signature of any agents representing the project proponent; and
- (i) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

- (j) *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.*
- (k) *Locations of floodplains or inundation areas for moderate or high hazard dams;*
- (l) *Locations of local or National Historic Districts;*

- 1.2.2 Documentation of actual or prospective access and control of the project site (see also Section 1.3.1.1);
- 1.2.3 An operation and maintenance plan (see also Section 1.3.1.2);
- 1.2.4 Proof of liability insurance; and
- 1.2.5 A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required Site Plan Review notification procedures and otherwise inform abutters and the community.

Commentary: Provision 1.2.6 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.

1.3 Site Plan Review Design and Operation Standards

1.3.1 Standards for large-scale ground-mounted solar energy systems

- 1.3.1.1 Site Control - The project proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar energy system.
- 1.3.1.2 Operation & Maintenance Plan - The project proponent shall submit a plan for the operation and maintenance of the large-scale ground-mounted solar energy system, which shall include measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation.
- 1.3.1.3 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.
- 1.3.1.4 Lighting - Lighting of large-scale ground-mounted solar energy systems shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar energy system shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

1.3.1.5 Signage - Signs on large-scale ground-mounted solar energy systems shall comply with a municipality's sign bylaw/ordinance. A sign consistent with a municipality's sign bylaw/ordinance shall be required to identify the owner and provide a 24-hour emergency contact phone number. Solar energy systems shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar energy system.

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

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

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for large-scale solar energy facilities should be aware of any unique local requirements that could apply.

1.3.1.8 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of solar energy system or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

1.3.2 Monitoring and Maintenance

1.3.2.1 Solar Energy System Installation Conditions - The large-scale ground-mounted solar energy system owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief, Emergency Management Director, and Emergency Medical Services. The owner or operator

shall be responsible for the cost of maintaining the solar energy system and any access road(s), unless accepted as a public way.

1.3.2.2 Modifications - All material modifications to a large-scale ground-mounted solar energy system made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

1.3.3 Abandonment or Decommissioning

1.3.3.1 Removal Requirements

Any large-scale ground-mounted solar energy system which has reached the end of its useful life or has been abandoned consistent with Section 1.3.3.2 of this bylaw/ordinance shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

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

1.3.3.2 Abandonment

Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the large-scale ground-mounted solar energy system shall be considered abandoned when it fails to operate for more than one year without the written consent of the Site Plan Review Authority. If the owner or operator of the solar energy system 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 energy system. As a condition of Site Plan approval, the applicant and landowner

shall agree to allow entry to remove an abandoned or decommissioned installation.

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

Commentary: As drafted, this model zoning does not require large-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 3 (Site Plan Review provisions for roof-mounted and small-scale ground-mounted solar energy systems as part of a larger project that triggers Site Plan Review):

1.0 Site Plan Review

1.1 Site Plan Document Requirements

1.1.1 Requirements for Roof-Mounted and Small-Scale Ground-Mounted Solar Energy Systems - Where these solar energy systems may be accessory to a use allowed through Site Plan Review, the Site Plan Review shall include review of their adequacy, location, arrangement, size, design, and general site compatibility.

1.1.1.1 Roof-Mounted Solar Energy Systems – For all roof-mounted systems, the applicant shall provide:

- (a) The shortest distance between the solar collector and all edges of the roof.
- (b) The distance between the solar collector and any other existing rooftop features such as chimneys, spires, access points, etc.
- (c) The height of the solar collector both from finished grade and, where applicable, from the finished surface of the roof.

1.1.1.2 Small-Scale Ground-Mounted Solar Energy Systems – For all ground-mounted systems, the applicant shall provide:

- (a) The distance between the proposed solar collector and all property lines and existing on-site buildings and structures.
- (b) The tallest finished height of the solar collector.
- (c) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.

1.1.1.3 System Components – The Plan must include documentation of the major system components to be used, for example the panels, mounting system, and inverter.

1.1.1.4 Installer Details – The Plan must include the name, address, and contact information for proposed system installer.

1.2 Site Plan Review Design Standards

1.2.1 Standards for roof-mounted and small-scale ground-mounted solar energy systems

1.2.1.1 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.

1.2.1.2 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).

Commentary: 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.

1.2.1.3 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.

Special Permits

Commentary: Special Permits are addressed in Chapter 9 of the Zoning Act, and most Massachusetts communities have regulations pertaining to them within their zoning bylaw or ordinance. Below is model language for municipalities requiring special permits for large-scale ground-mounted solar energy systems. It is intended to be adopted and implemented alongside Site Plan Review language for large-scale ground-mounted systems included as Example 2 in this model zoning. Rather than include separate special permit standards applicable specifically to large-scale ground-mounted solar energy systems, this language simply directs that a permit be issued pursuant to the already established special permit bylaw/ordinance of the community.

Municipalities will, however, want to audit their special permit language, especially the approval standards, for compatibility with the siting of large-scale ground-mounted solar energy systems. Such systems should have far lower impacts than commercial or industrial uses that often require issuance of special permit, and communities should keep in mind the requirement in Chapter 40A Section 3 that any regulations pertaining to solar energy systems be reasonable.

1.0 Special Permit with Site Plan Review

1.1 Special Permit Requirements

- 1.1.1 Where required a special permit shall be issued prior to construction, installation or modification of any large-scale ground-mounted solar energy system. The special permit granting authority shall include as part of its special permit review and proceedings all the provisions and requirements of the Site Plan Review standards applicable to large-scale ground-mounted solar energy systems.

Pre-Existing Non-Conforming Uses and Structures

Commentary: Alterations, extensions and structural changes to pre-existing non-conforming uses and structures (e.g., existing buildings that do not meet the dimensional requirements of the Zoning Bylaw/Ordinance) that intensify non-conformities or result in additional non-conformities may not be allowed beyond a certain threshold or may require a Special Permit pursuant to the local Zoning Bylaw/Ordinance. It is recommended that the installation of roof-mounted or small-scale ground-mounted solar energy systems associated with pre-existing non-conforming uses or structures be exempt from this requirement. An example provision is provided below. Communities not comfortable with providing this exemption to small-scale ground mounted systems due to their potential to be located on very small lots may wish to apply Site Plan Review or continue to require a Special Permit where this can be justified to protect public health, safety, or welfare. As to roof mounted systems on non-conforming properties, given the exemption afforded solar energy systems, DOER believes it would be unreasonable to disallow them or require a Special Permit even when installation would exacerbate a pre-existing building height non-conformity.

Example:

1.0 Pre-Existing Non-Conforming Uses and Structures

- 1.1 Improvements that do not change the use or the basic exterior characteristics or appearance of the building or structure are allowed. Such improvements include but are not limited to the following:

- 1.1.1 Installation or replacement of solar energy systems.

Historic Districts

Commentary: Many communities in the Commonwealth have adopted Local Historic Districts to protect and preserve buildings, landscapes and neighborhoods of historic significance. In recent years, conflict has occasionally arisen about the installation of solar energy systems within these districts on historic buildings and structures, since some argue that they have adverse impacts on the visual appearance and integrity of the buildings and structures.

As described in the DOER Policy Guidance for Regulating Solar Energy Systems, Local Historic District Commissions must consider the policy of the Commonwealth to encourage the use of solar energy systems and to protect solar access when considering issuance of a certificate of appropriateness for a solar energy system. However, thoughtful design guidelines can help ensure that solar energy systems are sited while the goals of historic preservation continue to be achieved.

Design guidelines can require that solar energy systems not be visible from public areas, to the greatest extent practicable. When it is not feasible (either physically or economically) to locate solar energy systems out of the public eye, solar energy systems can be required to be designed to certain architectural standards (e.g., building-integrated, use of solar shingles) to the greatest extent practicable. However, these options may be infeasible as well due to the high cost and low performance of many of these technologies. To meet these challenges, Local Historic District Commissions are encouraged to write design guidelines that support the development of solar energy systems and are sensitive to the historic preservation goals of the Commission.

Solar Regulations in Other Towns

Lexington

Definitions

Solar Energy System: A device or structural design feature, a substantial purpose of which is providing for the collection, storage, and distribution of solar energy for space heating or cooling, electrical generation, or water heating.

Solar Energy System Building Mounted: A Solar Energy System that is designed to be securely mounted on a building.

Solar Energy System, Canopy: A Solar Energy System structure that is built to cover a parking lot or other open-air use that is not a Building-mounted Solar Energy System.

Solar Energy System, Canopy, Large Scale: A Solar Energy System that is not a -Building-mounted Solar Energy System, Canopy Solar Energy System, or Small-scale Solar Energy System. Permitted as an accessory use provided it is a use or structure that is customary and incidental to a principal use or structure permitted in the use regulations.

Solar Energy System, Small Scale: A Solar Energy System that is not a Building-mounted Solar Energy System or Canopy Solar Energy System where the total lot area covered by all Solar Energy Systems on the lot is less than or equal to 1,500 square feet.

Land Use

Building-mounted Solar Energy Systems and Small-Scale Energy Systems are permitted by right across all zoning districts. Permitted as a principal use. Permitted as an accessory use provided it is a use or structure that is customary and incidental to a permitted principal use or structure.

Canopy Solar Energy Systems and Large-Scale Energy Systems permitted as-of-right under site plan review across all zoning districts. Permitted as a principal use. Permitted as an accessory use provided it is a use or structure that is customary and incidental to a permitted principal use or structure.

Site Coverage

Solar Energy Systems are exempt from the site coverage requirements of the by-law.

Setback Requirements

Solar Energy Systems are defined as structures and are subject to the setback requirements of the district in which they are located. Notwithstanding the above structures that are not buildings may be located in a minimum front, rear or side yard provided the height of the structure is not greater than its horizontal lot line except, that solar energy systems may be located over any parking lot. Large-scale solar energy systems located in the front, side or rear minimum yard setback require a special permit.

Height Regulations for Structures on a Building.

Structures erected on a building and not used for human occupancy may exceed the maximum height of a building in height provided no part of the structure is more than 20 feet higher than the upper elevation of

the building. The by-law exempts Solar Energy Systems from the maximum roof coverage requirement of 25%.

Design Standards

The Planning Board may adopt regulations providing reasonable design standards for Solar Energy Systems. The standards may not be more restrictive than those applied to other structures.

Site Plan and Special Permit Approval

Small Scale Solar Energy systems located in the front, side or rear minimum required yard are subject to site plan review. Large Scale Solar Energy systems located in the front, side or rear minimum required yard are subject to a special permit.

Sudbury

Definitions

Solar Energy System: A system whose primary purpose is to harvest energy by transforming solar energy into another form of energy, such as electricity, or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.

Solar Energy System, Ground Mounted: An active Solar Energy System that is structurally mounted to the ground and is not roof mounted.

Solar Energy System, Large Scale Ground Mounted: An active Solar Energy System that occupies more than 1,750 square feet of surface area (equivalent to a rated nameplate capacity of about 10 kW DC or greater), except in the Single Residence "A", Single Residence "C", and Wayside Inn Historic Preservation Residential Zone Districts, where such systems occupy more than 500 square feet of surface area.

Solar Energy System, Roof Mounted: An active Solar Energy System that is structurally mounted to the roof of a building or structure.

Solar Energy System, Small Scale Ground Mounted: An active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less), except in the Single Residence "A", Single Residence "C", and Wayside Inn Historic Preservation Residential Zone Districts, where such systems occupy 500 square feet of surface area or less.

Land Use

Roof Mounted Installations. Solar Energy Systems installed on roofs of buildings or structures shall conform to the following provisions:

- a. Roof Mounted Solar Energy Systems of any size on single- and two-family dwellings are permitted as of right and are not subject to Site Plan Review.
- b. Roof Mounted Solar Energy Systems of any size on multi-family dwellings and all non-residential buildings are permitted as of right but require Site Plan Review.

Ground Mounted Installations. Ground Mounted Solar Energy Systems shall conform to the following provisions:

- a. Ground Mounted Solar Energy Systems are permitted across all districts but require Site Plan Review prior to being erected. Systems which also require a special permit from the Board of Appeals shall require Site Plan Review prior to applying for a special permit.
- b. Ground Mounted Solar Energy Systems may, at the discretion of the Planning Board, obtain Minor Site Plan approval. Systems proposed to be located over parking or other vehicular areas, in lieu of naturally vegetated land, are strongly encouraged to seek this form of Site Plan Review.

Site Coverage

The entire square footage for the arrays of a Ground Mounted Solar Energy System count toward the area of disturbance and impervious area square footage calculations.

Setback Requirements

All setback, yard, buffer, and screening requirements applicable in the zoning district in which the Ground Mounted Solar Energy System, and all related structures, buildings, and equipment, are located shall apply, except for power feed and distribution lines.

Ground Mounted Solar Energy Systems proposed to be located in the area between a property's lot frontage and an existing or proposed building shall require a special permit from the Board of Appeals.

All security fences surrounding a Ground Mounted Solar Energy System shall be set back from property lines a distance equal to the setback requirement applicable to buildings within the zoning district in which the system is located.

Height Regulations for Structures on a Building

All height requirements applicable in the zoning district in which the Ground Mounted Solar Energy System, and all related structures, buildings, and equipment, are located apply.

Design Standards

The visual impact of a Ground Mounted Solar Energy System, including all accessory structures, buildings, equipment, and appurtenances, shall be mitigated. All accessory structures, buildings, equipment, and appurtenances shall be architecturally compatible with each other. Whenever reasonable, structures shall be shielded from view by vegetation and/or joined and clustered to avoid adverse visual impacts. Methods such as the use of landscaping, natural features, and fencing shall be utilized.

Wherever possible, all utility connections, conduits, cables, power lines, transformers, and inverters shall be placed underground unless specifically permitted otherwise by the Planning Board or required by the State Building Code. Electrical transformers and inverters to enable utility interconnections may be above ground if required by the utility provider.

Site Plan and Special Permit Approval

Roof Mounted Solar Energy Systems of any size on multi-family dwellings and all non-residential buildings are permitted as of right but require Site Plan Review. Ground Mounted Solar Energy Systems require Site Plan Review.

Westwood

Definitions

Large Scale Solar: Any solar energy system which is not a “Roof-mounted Solar” and which occupies more than 5,000 square feet of surface area.

Roof-mounted Solar: Any solar arrays, facilities, or solar photovoltaic installations mounted to the roof or top of a structure and which do not extend or project beyond the eaves, ridge, or sides of said structure.

Other Solar: Any solar energy system which does not meet the definition of “Roof-mounted Solar” or “Large Scale Solar”.

Land Use

Roof-mounted Solar is permitted by right across all zoning districts. Permitted as both a principal use and an accessory use upon issuance of applicable Building and Electrical Permits.

Large-scale Solar and Other Solar is permitted as of right across all zoning districts subject to Solar Design Review and Approval by the Planning Board in the instance of a principle use. Administrative Approval by the Town Planner for Other Solar is permitted in the instance where such facility is proposed as an accessory use. A solar energy system is considered a principle use if it is the only use on the parcel or if the footprint of the components of the solar energy system exceeds the footprint of all other structures on the lot.

Site Coverage

Ground-mounted solar energy systems are exempt from the site coverage requirements of the by-law.

Setback Requirements

All dimensional requirements including setback, yard, buffer, and screening requirements applicable in the zoning district in which the Large-Scale Solar, Roof-mounted Solar, or Other Solar systems are located apply.

Height Regulations for Structures on a Building

All height requirements applicable in the zoning district in which the Large-Scale Solar, Roof-mounted Solar, or Other Solar systems are located apply.

Design Standards

The Planning Board may impose reasonable conditions to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures when conducting Solar Design Review and Approval.

Site Plan and Special Permit Approval

Large-scale Solar and Other Solar is permitted as of right subject to Solar Design Review and Approval by the Planning Board in the instance of a principle use. Administrative Approval by the Town Planner for Other Solar is permitted in the instance where such facility is proposed as an accessory use.

Woburn

Definitions

Photovoltaic System: (also referred to as Photovoltaic Installation): An active solar energy system that converts solar energy directly into electricity.

Solar Access: The access of a solar energy system to direct sunlight.

Solar Collector: A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy. (

Solar Energy: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Solar Energy System: A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.

- a) **Solar Energy System, Active:** A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.
- b) **Solar Energy System, Carport/Canopy:** An accessory structure designed and utilized principally for the support of a solar energy system. For purposes of this Ordinance, a Solar Carport/Canopy is considered to be ground-mounted.
- c) **Solar Energy System, Grid-Intertie:** A photovoltaic system that is connected to an electric circuit served by an electric utility.
- d) **Solar Energy System, Ground-Mounted:** An Active Solar Energy
- e) System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale).
- f) **Solar Energy System, Large-Scale:** An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).
- g) **Solar Energy System, Medium Scale:** An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC).
- h) **Solar Energy System, Off-Grid:** A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility.
- i) **Solar Energy System, Passive:** A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.
- j) **Solar Energy System, Roof-Mounted:** An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale).
- k) **Solar Energy System, Small-Scale:** An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).

Solar Thermal System: An Active Solar Energy System that uses collectors to convert the sun's rays into useful forms of energy for water heating, space heating, or space cooling.

Land Use

Residential Use Regulations: In all residential districts roof-mounted solar energy systems are permitted as of right. Small-Scale, Medium-Scale and Large-Scale Ground-Mounted Solar Energy Systems are permitted by special permit on municipal and school properties.

Non-Residential District Use Regulations (Excludes Technology and Business Use Overlay District: Roof-Mounted Solar Energy Systems and Small-Scale Ground-Mounted Solar Energy Systems are permitted as of right. Medium-Scale Ground-Mounted Solar Energy Systems, Large-Scale Ground-Mounted Solar Energy Systems and Solar Carport/Canopy systems are permitted as of right with site plan review. Small-Scale, Medium-Scale and Large-Scale Ground-Mounted Solar are permitted on municipal and school property by special permit.

In Technology and Business Use Overlay District: Roof-Mounted Solar Energy Systems, Small-Scale Ground-Mounted Solar Energy Systems, Medium-Scale Ground-Mounted Solar Energy Systems, Large-Scale Ground-Mounted Solar Energy Systems, Solar Carport/Canopy systems, Off-Grid Passive, and Solar Thermal systems are permitted as of right with site plan review.

Site Coverage

Ground-mounted solar energy systems are included in the Maximum Lot coverage requirements of the by-law. All coverage requirements of the underlying district apply.

Setback Requirements

Dimensional and Density Setbacks – Residential and Non-residential Districts: For all ground-mounted solar photovoltaic installations the minimum front, side and rear setbacks shall be as follows:

Residential: Front Setback: 50 feet; Side Setback: 50 feet and Rear Setback: 50 feet.

Non- Residential: Front Setback: 50 feet; Side Setback: 50 feet and Rear Setback: 50 feet.

All other yard and space requirements of the underlying zoning district shall also apply, except that no ground-mounted solar photovoltaic installations shall be installed in front yards.

An additional Setback Requirement applies when a Ground Mounted Solar Photovoltaic installation is constructed on a lot which adjoins land in a Residential Zoning District, in such case there is an additional setback of seventy (70) feet in addition to the minimum side and rear yard setbacks.

All appurtenant structures to a ground-mounted solar photovoltaic installation shall be subject to the requirements of the Zoning Ordinance concerning yard, space, and setback requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other.

Height Regulations for Solar Carports/Canopies.

The height limit for all solar carports/canopies is twenty (20) feet and all other ground-mounted solar photovoltaic installations are limited to fifteen (15) feet. All other height requirements of the underlying zoning district apply.

Design Standards

All solar carports/canopies and ground-mounted solar photovoltaic installations shall be screened from view of abutting properties and streets, to the extent practicable. Screening may consist of fences, vegetation, evergreen plantings, topography and earthen berms so long as they do not interfere with or encroach upon sight lines or violate other provisions of the Woburn Municipal Code, Woburn Zoning Code or the Woburn Land Subdivision Rules and Regulations.

Security fencing shall be required around any medium-scale or large-scale ground mounted solar energy systems.

Site Plan and Special Permit Approval

Small-Scale, Medium-Scale and Large-Scale Ground-Mounted Solar Energy Systems are permitted by special permit on municipal and school properties in all districts.

In Non-Residential Districts Medium-Scale Ground-Mounted Solar Energy Systems, Large-Scale Ground-Mounted Solar Energy Systems and Solar Carport/Canopy systems are permitted as of right with site plan review.

Natick

Definitions

Solar Energy System, Active: A solar energy system whose primary purpose is to harvest solar energy into another form of energy or to transfer heat from a collector to another medium using mechanical, electrical, or chemical means. Active Solar Energy Systems include, but are not limited to, the following installation types:

Solar Energy System, Building-mounted: An Active Solar Energy System that is structurally mounted to a building or structure.

Solar Energy System, Roof-mounted: A special application of a Building-mounted Solar Energy System that is structurally mounted to the roof of a building or structure.

Solar Energy System, Ground-mounted: An Active Solar Energy System that is structurally mounted to the ground.

Solar Energy System, Small-Scale Ground-mounted: A Ground-mounted Solar Energy System that occupies 1,750 square feet of surface area or less.

Solar Energy System, Medium-Scale Ground-mounted: A Ground-mounted Solar Energy System that occupies more than 1,500 square feet, but less than 40,000 square feet of surface area.

Solar Parking Canopy: A special application of a Ground-mounted Solar Energy System that is installed on top of a parking surface or paved surface that maintains the function of the area beneath the canopy.

Solar Energy System, Building-integrated Photovoltaic (BIPV): An Active Solar Energy System that consists of integrating solar photovoltaic (PV) modules into the surface of a building or structure, where the solar panels themselves function as, or are integrated into, a building material (i.e., roof shingles, siding, windows, skylights) or structural element (i.e., façade). The generation of solar energy is secondary to the function of the building material or structural element.

Solar Energy System, Surface-integrated: An Active Solar Energy System that is not building-mounted and is integrated into a ground level surface, such as a driveway, walkway, patio surface, path, or parking area, where the solar panels themselves function as, or are integrated into, the surface material. The generation of solar energy is secondary to the function of the surface element.

Solar Energy System, Passive: A Solar Energy System that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

Land Use

Roof-mounted Solar is permitted by right across all zoning districts. Permitted as both a principal use and an accessory use upon issuance of applicable Building and Electrical Permits.

In residential districts: Small-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted as-of-right in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems are permitted subject to site plan review by the Special Permit Granting Authority.

In nonresidential districts: Small-scale Ground-mounted Solar Energy Systems are permitted as-of-right in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted subject to site plan review by the Special Permit Granting Authority.

Site Coverage

Ground-mounted solar energy systems are included in Maximum Lot coverage requirements of the by-law. All coverage requirements of the underlying district apply.

Setback Requirements

Ground-mounted Solar Energy Systems are defined as structures and are subject to the setback requirements of the district in which they are located. Notwithstanding the above, Solar Parking Canopies in residential districts are subject to the setback requirements for accessory structures.

Height Regulations for Structures on a Building

Roof Mounted

All height requirements applicable in the zoning district in which the roof mounted solar system is installed apply. Notwithstanding the above, Roof-mounted Solar Energy Systems may extend up to one foot above the roof surface on which the system is installed beyond applicable building height limits where roof pitch is greater than or equal to 3 fifteen-degree angle. Roof-mounted Solar Energy Systems having less than a fifteen-degree angle may extend up to three feet above the roof surface on which the system is installed beyond applicable building height limits. If the surface on which the system is to be mounted is below maximum building height, the Roof-mounted Solar Energy System may extend up to six feet above the roof surface on which the system is installed, provided it does not exceed building height limits by more than three feet; and provided further that any Roof-mounted Solar Energy System that extends more than three feet above the roof surface on which the system is installed must be installed at least three feet from the roof's edge.

Gound Mounted

Small-Scale Ground-mounted Solar Energy System in all Districts – Twelve vertical feet from grade.

Medium-Scale Ground-mounted Solar Energy System in all Districts – Twelve vertical feet from grade.

Solar Parking Canopy in Residential Districts - The maximum height allowed on the lot or the height of the principal structure, whatever is less.

Solar Parking Canopy in Non-Residential Districts – Subject to Site Plan Review by Special Permit Granting Authority.

Design Standards

The Planning Board may impose reasonable conditions to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures when conducting Site Plan Review and Approval.

Site Plan and Special Permit Approval

In residential districts: Medium-scale Ground-mounted Solar Energy Systems is permitted subject to site plan review by the Special Permit Granting Authority.

In nonresidential districts: Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted subject to site plan review by the Special Permit Granting Authority.

Other Communities

Zoning By-Laws from the following additional communities were also reviewed. These communities had adopted minimal provisions for solar energy systems limited in most instances to Large Scale Solar Photovoltaic installations through a Special Permit process. The communities reviewed are detailed below:

Concord – “solar canopy, small scale solar and medium scale solar ” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted installations.

Newton – “solar” appears solely in Section 1.5.4 which states “Solar panels which do not extend more than 1 foot above the ridgeline or in the case of a flat roof, no more than 4 feet above the parapet, unless greater extensions are allowed by special permit.”

Wellesley - “solar canopy, small scale solar, and medium scale solar” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted.

Acton - “solar canopy, small scale solar and medium scale solar” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted installations.

Winchester - “solar canopy, small scale and medium scale solar” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted installations.

Dedham - “solar canopy, small scale and medium scale solar” does not appear. No mention of solar installation in the Dedham Zoning By-Law.

Table comparing Solar Regulations in Lexington, Sudbury, Westwood, Woburn and Natick

Prepared in November, 2023.

	Lexington	Sudbury	Westwood	Woburn	Natick
Definitions	<u>Solar Energy System</u>: A device or structural design feature, a substantial purpose of which is providing for the collection, storage, and distribution of solar energy for space heating or cooling, electrical generation, or water heating. <u>Solar Energy System Building Mounted</u>: A Solar Energy System that is designed to be securely mounted on a building. <u>Solar Energy System, Canopy</u>: A Solar Energy System structure that is built to cover a parking lot or other open-air use that is not a Building-mounted Solar Energy System. <u>Solar Energy System, Canopy, Large Scale</u>: A Solar Energy System that is not a -Building-mounted Solar Energy System, Canopy Solar Energy System, or Small-scale Solar Energy System. Permitted as an accessory use provided it is a use or structure that is customary and incidental to a principal use or structure permitted in the use regulations. <u>Solar Energy System, Small Scale</u>: A Solar Energy System that is not a Building-mounted Solar Energy System or Canopy Solar Energy System where the total lot area covered by all Solar Energy Systems on the lot is less than or equal to 1,500 square feet.	<u>Solar Energy System</u>: A system whose primary purpose is to harvest energy by transforming solar energy into another form of energy, such as electricity, or transferring heat from a collector to another medium using mechanical, electrical, or chemical means. <u>Solar Energy System, Ground Mounted</u>: An active Solar Energy System that is structurally mounted to the ground and is not roof mounted. <u>Solar Energy System, Large Scale Ground Mounted</u>: An active Solar Energy System that occupies more than 1,750 square feet of surface area (equivalent to a rated nameplate capacity of about 10 kW DC or greater), except in the Single Residence "A", Single Residence "C", and Wayside Inn Historic Preservation Residential Zone Districts, where such systems occupy more than 500 square feet of surface area. <u>Solar Energy System, Roof Mounted</u>: An active Solar Energy System that is structurally mounted to the roof of a building or structure. <u>Solar Energy System, Small Scale Ground Mounted</u>: An active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less), except in the Single Residence "A", Single Residence "C", and Wayside Inn Historic Preservation Residential Zone Districts, where such systems occupy 500 square feet of surface area or less.	<u>Large Scale Solar</u>: Any solar energy system which is not a “Roof-mounted Solar” and which occupies more than 5,000 square feet of surface area. <u>Roof-mounted Solar</u>: Any solar arrays, facilities, or solar photovoltaic installations mounted to the roof or top of a structure and which do not extend or project beyond the eaves, ridge, or sides of said structure. <u>Other Solar</u>: Any solar energy system which does not meet the definition of “Roof-mounted Solar” or “Large Scale Solar”.	<u>Photovoltaic System</u>: (also referred to as Photovoltaic Installation): An active solar energy system that converts solar energy directly into electricity. <u>Solar Access</u>: The access of a solar energy system to direct sunlight. <u>Solar Collector</u>: A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy. (<u>Solar Energy</u>: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector. <u>Solar Energy System</u>: A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating. a) <u>Solar Energy System, Active</u>: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means. b) <u>Solar Energy System, Carport/Canopy</u>: An accessory structure designed and utilized principally for the support of a solar energy system. For purposes of this Ordinance, a Solar Carport/Canopy is considered to be ground-mounted. c) <u>Solar Energy System, Grid-Intertie</u>: A photovoltaic system that is connected to an electric circuit served by an electric utility. d) <u>Solar Energy System, Ground-Mounted</u>: An Active Solar Energy e) System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale). f) <u>Solar Energy System, Large-Scale</u>: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater). g) <u>Solar Energy System, Medium Scale</u>: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC). h) <u>Solar Energy System, Off-Grid</u>: A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility. i) <u>Solar Energy System, Passive</u>: A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger. j) <u>Solar Energy System, Roof-Mounted</u>: An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale). k) <u>Solar Energy System, Small-Scale</u>: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less). <u>Solar Thermal System</u>: An Active Solar Energy System that uses collectors to convert the sun’s rays into useful forms of energy for water heating, space heating, or space cooling.	<u>Solar Energy System, Active</u>: A solar energy system whose primary purpose is to harvest solar energy into another form of energy or to transfer heat from a collector to another medium using mechanical, electrical, or chemical means. Active Solar Energy Systems include, but are not limited to, the following installation types: <u>Solar Energy System, Building-mounted</u>: An Active Solar Energy System that is structurally mounted to a building or structure. <u>Solar Energy System, Roof-mounted</u>: A special application of a Building-mounted Solar Energy System that is structurally mounted to the roof of a building or structure. <u>Solar Energy System, Ground-mounted</u>: An Active Solar Energy System that is structurally mounted to the ground. <u>Solar Energy System, Small-Scale Ground-mounted</u>: A Ground-mounted Solar Energy System that occupies 1,750 square feet of surface area or less. <u>Solar Energy System, Medium-Scale Ground-mounted</u>: A Ground-mounted Solar Energy System that occupies more than 1,500 square feet, but less than 40,000 square feet of surface area. <u>Solar Parking Canopy</u>: A special application of a Ground-mounted Solar Energy System that is installed on top of a parking surface or paved surface that maintains the function of the area beneath the canopy. <u>Solar Energy System, Building-integrated Photovoltaic (BIPV)</u>: An Active Solar Energy System that consists of integrating solar photovoltaic (PV) modules into the surface of a building or structure, where the solar panels themselves function as, or are integrated into, a building material (i.e., roof shingles, siding, windows, skylights) or structural element (i.e., façade). The generation of solar energy is secondary to the function of the building material or structural element. <u>Solar Energy System, Surface-integrated</u>: An Active Solar Energy System that is not building-mounted and is integrated into a ground level surface, such as a driveway, walkway, patio surface, path, or parking area, where the solar panels themselves function as, or are integrated into, the surface material. The generation of solar energy is secondary to the function of the surface element. <u>Solar Energy System, Passive</u>: A Solar Energy System that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

	Lexington	Sudbury	Westwood	Woburn	Natick
Land Use	Building-mounted Solar Energy Systems and Small-Scale Energy Systems are permitted by right across all zoning districts. Permitted as a principal use. Permitted as an accessory use provided it is a use or structure that is customary and incidental to a permitted principal use or structure. Canopy Solar Energy Systems and Large-Scale Energy Systems permitted as-of-right under site plan review across all zoning districts. Permitted as a principal use. Permitted as an accessory use provided it is a use or structure that is customary and incidental to a permitted principal use or structure.	<u>Roof Mounted Installations.</u> Solar Energy Systems installed on roofs of buildings or structures shall conform to the following provisions: a. Roof Mounted Solar Energy Systems of any size on single- and two-family dwellings are permitted as of right and are not subject to Site Plan Review. b. Roof Mounted Solar Energy Systems of any size on multi-family dwellings and all non-residential buildings are permitted as of right but require Site Plan Review. <u>Ground Mounted Installations.</u> Ground Mounted Solar Energy Systems shall conform to the following provisions: a. Ground Mounted Solar Energy Systems are permitted across all districts but require Site Plan Review prior to being erected. Systems which also require a special permit from the Board of Appeals shall require Site Plan Review prior to submitting an application for a special permit. b. Ground Mounted Solar Energy Systems may, at the discretion of the Planning Board, obtain Minor Site Plan approval. Systems proposed to be located over parking or other vehicular areas, in lieu of naturally vegetated land, are strongly encouraged to seek this form of Site Plan Review.	Roof-mounted Solar is permitted by right across all zoning districts. Permitted as both a principal use and an accessory use upon issuance of applicable Building and Electrical Permits. Large-scale Solar and Other Solar is permitted as of right across all zoning districts subject to Solar Design Review and Approval by the Planning Board in the instance of a principle use. Administrative Approval by the Town Planner for Other Solar is permitted in the instance where such facility is proposed as an accessory use. A solar energy system is considered a principle use if it is the only use on the parcel or if the footprint of the components of the solar energy system exceeds the footprint of al other structures on the lot.	Residential Use Regulations: In all residential districts roof-mounted solar energy systems are permitted as of right. Small-Scale, Medium-Scale and Large-Scale Ground-Mounted Solar Energy Systems are permitted by special permit on municipal and school properties. Non-Residential District Use Regulations (Excludes Technology and Business Use Overlay District: Roof-Mounted Solar Energy Systems and Small-Scale Ground-Mounted Solar Energy Systems are permitted as of right. Medium-Scale Ground-Mounted Solar Energy Systems, Large-Scale Ground-Mounted Solar Energy Systems and Solar Carport/Canopy systems are permitted as of right with site plan review. Small-Scale, Medium-Scale and Large-Scale Ground-Mounted Solar are permitted on municipal and school property by special permit. In Technology and Business Use Overlay District: Roof-Mounted Solar Energy Systems, Small-Scale Ground-Mounted Solar Energy Systems, Medium-Scale Ground-Mounted Solar Energy Systems, Large-Scale Ground-Mounted Solar Energy Systems, Solar Carport/Canopy systems, Off-Grid Passive, and Solar Thermal systems are permitted as of right with site plan review.	Roof-mounted Solar is permitted by right across all zoning districts. Permitted as both a principal use and an accessory use upon issuance of applicable Building and Electrical Permits. In residential districts: Small-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted as-of-right in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems are permitted subject to site plan review by the Special Permit Granting Authority. In nonresidential districts: Small-scale Ground-mounted Solar Energy Systems are permitted as-of-right in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted subject to site plan review by the Special Permit Granting Authority.

	Lexington	Sudbury	Westwood	Woburn	Natick
<u>Site Coverage</u>	Solar Energy Systems are exempt from the site coverage requirements of the by-law.	The entire square footage for the arrays of a Ground Mounted Solar Energy System count toward the area of disturbance and impervious area square footage calculations.	Ground-mounted solar energy systems are exempt from the site coverage requirements of the by-law.	Ground-mounted solar energy systems are included in the Maximum Lot coverage requirements of the by-law. All coverage requirements of the underlying district apply.	Ground-mounted solar energy systems are included in Maximum Lot coverage requirements of the by-law. All coverage requirements of the underlying district apply.
<u>Setback Requirements</u>	Solar Energy Systems are defined as structures and are subject to the setback requirements of the district in which they are located. Notwithstanding the above structures that are not buildings may be located in a minimum front, rear or side yard provided the height of the structure is not greater than its horizontal lot line except, that solar energy systems may be located over any parking lot. Large-scale solar energy systems located in the front, side or rear minimum yard setback require a special permit.	All setback, yard, buffer, and screening requirements applicable in the zoning district in which the Ground Mounted Solar Energy System, and all related structures, buildings, and equipment, are located shall apply, except for power feed and distribution lines. Ground Mounted Solar Energy Systems proposed to be located in the area between a property’s lot frontage and an existing or proposed building shall require a special permit from the Board of Appeals. All security fences surrounding a Ground Mounted Solar Energy System shall be set back from property lines a distance equal to the setback requirement applicable to buildings within the zoning district in which the system is located.	All dimensional requirements including setback, yard, buffer, and screening requirements applicable in the zoning district in which the Large Scale Solar, Roof-mounted Solar, or Other Solar systems are located apply.	Dimensional and Density Setbacks – Residential and Non-residential Districts: For all ground-mounted solar photovoltaic installations the minimum front, side and rear setbacks shall be as follows: Residential: Front Setback: 50 feet; Side Setback: 50 feet and Rear Setback: 50 feet. Non- Residential: Front Setback: 50 feet; Side Setback: 50 feet and Rear Setback: 50 feet. All other yard, and space requirements of the underlying zoning district shall also apply, except that no ground-mounted solar photovoltaic installations shall be installed in front yards. An additional Setback Requirement applies when a Ground Mounted Solar Photovoltaic installation is constructed on a lot which adjoins land in a Residential Zoning District, in such case there is an additional setback of seventy (70) feet in addition to the minimum side and rear yard setbacks. All appurtenant structures to a ground-mounted solar photovoltaic installation shall be subject to the requirements of the Zoning Ordinance concerning yard, space, and setback requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other.	Ground-mounted Solar Energy Systems are defined as structures and are subject to the setback requirements of the district in which they are located. Notwithstanding the above, Solar Parking Canopies in residential districts are subject to the setback requirements for accessory structures.

	Lexington	Sudbury	Westwood	Woburn	Natick
<u>Height Regulations for Structures on a Building</u>	Structures erected on a building and not used for human occupancy may exceed the maximum height of a building in height provided no part of the structure is more than 20 feet higher than the upper elevation of the building. The by-law exempts Solar Energy Systems from the maximum roof coverage requirement of 25%.	All height requirements applicable in the zoning district in which the Ground Mounted Solar Energy System, and all related structures, buildings, and equipment, are located apply.	All height requirements applicable in the zoning district in which the Large Scale Solar, Roof-mounted Solar, or Other Solar systems are located apply.	The height limit for all solar carports/canopies is twenty (20) feet and all other ground-mounted solar photovoltaic installations are limited to fifteen (15) feet. All other height requirements of the underlying zoning district apply.	<u>Roof Mounted</u> All height requirements applicable in the zoning district in which the roof mounted solar system is installed apply. Notwithstanding the above, Roof-mounted Solar Energy Systems may extend up to one foot above the roof surface on which the system is installed beyond applicable building height limits where roof pitch is greater than or equal to 3 fifteen-degree angle. Roof-mounted Solar Energy Systems having less than a fifteen-degree angle may extend up to three feet above the roof surface on which the system is installed beyond applicable building height limits. If the surface on which the system is to be mounted is below maximum building height, the Roof-mounted Solar Energy System may extend up to six feet above the roof surface on which the system is installed, provided it does not exceed building height limits by more than three feet; and provided further that any Roof-mounted Solar Energy System that extends more than three feet above the roof surface on which the system is installed must be installed at least three feet from the roof's edge. <u>Ground Mounted</u> Small-Scale Ground-mounted Solar Energy System in all Districts – Twelve vertical feet from grade. Medium-Scale Ground-mounted Solar Energy System in all Districts – Twelve vertical feet from grade. Solar Parking Canopy in Residential Districts - The maximum height allowed on the lot or the height of the principal structure, whatever is less. Solar Parking Canopy in Non-Residential Districts – Subject to Site Plan Review by Special Permit Granting Authority.

	Lexington	Sudbury	Westwood	Woburn	Natick
<u>Design Standards</u>	The Planning Board may adopt regulations providing reasonable design standards for Solar Energy Systems. The standards may not be more restrictive than those applied to other structures.	The visual impact of a Ground Mounted Solar Energy System, including all accessory structures, buildings, equipment, and appurtenances, shall be mitigated. All accessory structures, buildings, equipment, and appurtenances shall be architecturally compatible with each other. Whenever reasonable, structures shall be shielded from view by vegetation and/or joined and clustered to avoid adverse visual impacts. Methods such as the use of landscaping, natural features, and fencing shall be utilized. Wherever possible, all utility connections, conduits, cables, power lines, transformers, and inverters shall be placed underground unless specifically permitted otherwise by the Planning Board or required by the State Building Code. Electrical transformers and inverters to enable utility interconnections may be above ground if required by the utility provider.	The Planning Board may impose reasonable conditions to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures when conducting Solar Design Review and Approval.	All solar carports/canopies and ground-mounted solar photovoltaic installations shall be screened from view of abutting properties and streets, to the extent practicable. Screening may consist of fences, vegetation, evergreen plantings, topography and earthen berms so long as they do not interfere with or encroach upon sight lines or violate other provisions of the Woburn Municipal Code, Woburn Zoning Code or the Woburn Land Subdivision Rules and Regulations. Security fencing shall be required around any medium-scale or large-scale ground mounted solar energy systems.	The Planning Board may impose reasonable conditions to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures when conducting Site Plan Review and Approval.
<u>Site Plan and Special Permit Approval</u>	Small Scale Solar Energy systems located in the front, side or rear minimum required yard are subject to site plan review. Large Scale Solar Energy systems located in the front, side or rear minimum required yard are subject to a special permit.	Roof Mounted Solar Energy Systems of any size on multi-family dwellings and all non-residential buildings are permitted as of right but require Site Plan Review. Ground Mounted Solar Energy Systems require Site Plan Review.	Large-scale Solar and Other Solar is permitted as of right subject to Solar Design Review and Approval by the Planning Board in the instance of a principle use. Administrative Approval by the Town Planner for Other Solar is permitted in the instance where such facility is proposed as an accessory use.	Small-Scale, Medium-Scale and Large-Scale Ground-Mounted Solar Energy Systems are permitted by special permit on municipal and school properties in all districts. In Non-Residential Districts Medium-Scale Ground-Mounted Solar Energy Systems, Large-Scale Ground-Mounted Solar Energy Systems and Solar Carport/Canopy systems are permitted as of right with site plan review.	In residential districts: Medium-scale Ground-mounted Solar Energy Systems is permitted subject to site plan review by the Special Permit Granting Authority. In nonresidential districts: Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted subject to site plan review by the Special Permit Granting Authority.

Other Communities

Zoning By-Laws from the following additional communities were also reviewed. These communities had adopted minimal provisions for solar energy systems limited in most instances to Large Scale Solar Photovoltaic installations through a Special Permit process. The communities reviewed are detailed below:

Concord – “solar canopy, small scale solar and medium scale solar ” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted installations.

Newton – “solar” appears solely in Section 1.5.4 which states “Solar panels which do not extend more than 1 foot above the ridgeline or in the case of a flat roof, no more than 4 feet above the parapet, unless greater extensions are allowed by special permit.”

Wellesley - “solar canopy, small scale solar, and medium scale solar” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted.

Acton - “solar canopy, small scale solar and medium scale solar” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted installations.

Winchester - “solar canopy, small scale and medium scale solar” does not appear. There is a “large scale solar photovoltaic” section, but it appears to only be for large scale ground mounted installations.

Dedham - “solar canopy, small scale and medium scale solar” does not appear. No mention of solar installation in the Dedham Zoning By-Law.

	State Model By-Law	Needham Draft By-Law
Definitions	<u>Photovoltaic System (also referred to as Photovoltaic Installation)</u>: An active solar energy system that converts solar energy directly into electricity. <u>Rated Nameplate Capacity</u>: The maximum rated output of electric power production of the photovoltaic system in watts of Direct Current (DC). <u>Solar Access</u>: The access of a solar energy system to direct sunlight. <u>Solar Collector</u>: A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy. <u>Solar Energy</u>: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector. <u>Solar Energy System</u>: A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating. <u>Solar Energy System, Active</u>: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means. <u>Solar Energy System, Grid-Intertie</u>: A photovoltaic system that is connected to an electric circuit served by an electric utility. <u>Solar Energy System, Ground-Mounted</u>: An Active Solar Energy System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale). <u>Solar Energy System, Large-Scale</u>: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater). <u>Solar Energy System, Medium-Scale</u>: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC). <u>Solar Energy System, Off-Grid</u>: A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility. <u>Solar Energy System, Passive</u>: A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger. <u>Solar Energy System, Roof-Mounted</u>: An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale). <u>Solar Energy System, Small-Scale</u>: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less). <u>Solar Thermal System</u>: An Active Solar Energy System that uses collectors to convert the sun’s rays into useful forms of energy for water heating, space heating, or space cooling.	<u>Solar Energy System</u> - a device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage, and distribution of solar energy for space heating or cooling, electricity generation, or water heating. Solar Energy Systems include the following system types: 1. A Solar Energy System, Active: A solar energy system whose primary purpose is to harvest solar energy into another form of energy or to transfer heat from a collector to another medium using mechanical, electrical, or chemical means. Active Solar Energy Systems include, but are not limited to, the following installation types: a) <u>Solar Energy System, Building-mounted</u>: An Active Solar Energy System that is structurally mounted to a building or structure. b) <u>Solar Energy System, Roof-mounted</u>: A special application of a Building-mounted Solar Energy System that is structurally mounted to the roof of a building or structure. c) <u>Solar Energy System, Ground-mounted</u>: An Active Solar Energy System that is structurally mounted to the ground. d) <u>Solar Energy System, Small-Scale Ground-mounted</u>: A Ground-mounted Solar Energy System that occupies 1,750 square feet of surface area or less. (Equivalent to a rated nameplate capacity of about 10 kW DC or less). e) <u>Solar Energy System, Medium-Scale Ground-mounted</u>: A Ground-mounted Solar Energy System that occupies more than 1,750 square feet, but less than 40,000 square feet of surface area. (Equivalent to a rated nameplate capacity of about 10 – 250 kW DC. f) <u>Solar Parking Canopy</u>: A special application of a Ground-mounted Solar Energy System that is installed on top of a parking surface or paved surface that maintains the function of the area beneath the canopy. g) <u>Solar Energy System, Building-integrated Photovoltaic (BIPV)</u>: An Active Solar Energy System that consists of integrating solar photovoltaic (PV) modules into the surface of a building or structure, where the solar panels themselves function as, or are integrated into, a building material (i.e., roof shingles, siding, windows, skylights) or structural element (i.e., façade). The generation of solar energy is secondary to the function of the building material or structural element. h) <u>Solar Energy System, Surface-integrated</u>: An Active Solar Energy System that is not building-mounted and is integrated into a ground level surface, such as a driveway, walkway, patio surface, path, or parking area, where the solar panels themselves function as, or are integrated into, the surface material. The generation of solar energy is secondary to the function of the surface element. <u>Solar Energy System, Passive</u>: A Solar Energy System that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.”

	State Model By-Law	Needham Draft By-Law
Land Use	1.0 Residential District Uses 1.1 Uses Permitted 1.1.1 Roof-Mounted Solar Energy Systems 1.1.2 Small-Scale Ground-Mounted Solar Energy Systems 1.2 Uses Allowed through Site Plan Review 1.2.1 Medium-Scale Ground-Mounted Solar Energy Systems 1.2.2 Large-Scale Ground-Mounted Solar Energy Systems in the R3 District 1.3 Uses Allowed via Special Permit 1.3.1 Large-Scale Ground-Mounted Solar Energy Systems in the R1 District 2.0 Non-Residential District Uses 2.1 Uses Permitted 2.1.1 Roof-Mounted Solar Energy Systems 2.1.2 Small-Scale Ground-Mounted Solar Energy Systems 2.1.3 Medium-Scale Ground-Mounted Solar Energy Systems 2.2 Uses Allowed through Site Plan Review 2.2.1 Large-Scale Ground-Mounted Solar Energy Systems	a) Roof-mounted Solar Energy Systems shall be permitted in all use districts. The installation of Roof-mounted Solar Energy Systems that: 1) comply with the regulations provided in this section; and 2) are located on properties with nonconforming uses or structures; and 3) do not increase the nonconformity of such nonconforming uses or structures except with respect to the dimensions of the Roof-mounted Solar Energy System in question shall not be considered a change, extension or alteration that requires a finding by the Zoning Board of Appeals per M.G.L. c.40A s.6. b) In residential districts: Small-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies shall be permitted in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems shall be permitted subject to site plan review by the Special Permit Granting Authority. c) In nonresidential districts: Small-scale Ground-mounted Solar Energy Systems shall be permitted in rear and side yards. Medium-scale Ground-mounted Solar Energy Systems and Solar Parking Canopies are permitted subject to site plan review by the Special Permit Granting Authority. The same regulations shall apply in residential districts for exempted uses as defined by M.G.L. c.40A s.3, or other state and federal statutes, and by the Needham Zoning By-Laws. d) Where Solar Energy Systems would be installed in a Historic District, the system shall require approval by the Historic District Commission.
Site Coverage	Solar energy systems shall not be included in calculations for lot coverage or impervious cover as defined in [INSERT SECTION REFERENCE FOR ‘DEFINITIONS’].	a) <u>Maximum Percentage (%) Lot Coverage</u> 1) Active Solar Energy Systems are not buildings as defined in the Needham Zoning By-Law and should not be treated as such. However, for the purpose of regulating lot coverage, the area of Active Solar Energy Systems shall count toward the Maximum Percentage (%) Lot Coverage as defined in the Intensity Regulations provided in the Needham Zoning By-Laws. 2) An Active Solar Energy System’s contribution toward Maximum Percentage (%) Lot Coverage shall be calculated as the total area of the system’s panels. For example, if a system includes ten (10) panels that are each three (3) feet by five (5) feet, the system’s contribution to Maximum Percentage (%) Lot Coverage would equal 150 square feet. 3) Such part of a Building-mounted Solar Energy System or Solar Parking Canopy that extends beyond the impervious area over which it is placed shall count toward Maximum Percentage (%) Lot Coverage. 4) For Ground–mounted Solar Energy Systems, the total surface area of the Solar Energy System shall count toward Maximum Percentage (%) Building Coverage. 5) To avoid double counting, the surface area of any Active Solar Energy System that is above an existing impervious surface shall <u>not</u> be included in the calculation of Maximum Percentage (%) Lot Coverage (i.e. the addition of a Roof-mounted Solar Energy System shall <u>not</u> increase the calculated Maximum Percentage Building Coverage on a lot because it will be located within a surface area - the building’s footprint - that is already counted).

	State Model By-Law	Needham Draft By-Law
Setback Requirements	Example Dimensional Table Footnotes for Accessory Installations: (1) Small- and medium-scale ground-mounted solar energy systems 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 (2) Small- and medium-scale ground-mounted solar energy systems accessory to a principal use may be located no closer than [twenty (20) feet] 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.	c) <u>Setbacks</u> 1) Ground-mounted Solar Energy Systems that move along an axis, unfold, or open shall be located so that the entirety of the equipment’s reach at all angles falls within the setback requirements. 2) Solar Parking Canopies in residential districts shall meet setback requirements for Accessory Structures. 3) Solar Parking Canopies and Surface-integrated Solar Energy Systems in non-residential zones shall be allowed where parking is permitted in accordance with the requirements defined in Section 5.1.3, Parking Plan and Design Requirements. The requirements for the planting of trees in landscaped strips within the parking area as defined in Section 5.1.3, Paragraphs (k) Landscape Areas and Paragraph (l) Trees should be met elsewhere on the lot. 4) All other Ground-mounted Solar Energy Systems shall meet requirements for District-level setbacks as defined in the Needham Zoning By-Laws. 5) Any reach of a Building-Mounted Solar Energy System shall comply with the setback requirements for that building.

Height Regulations for Structures on a Building	1.0 Height Regulations 1.1 Ground-mounted Solar Energy Systems 1.1.1 Existing zoning district height limitations apply for all ground-mounted solar energy systems. If the ground-mounted solar energy system is accessory to a principal building or structure on a lot, then the height restriction for accessory structures applies. If the ground-mounted solar energy system is the principal structure on a lot, then the height restriction for principal structures applies. 1.2 Building Height Exemptions 1.2.1 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.	1) Building-mounted Solar Energy Systems:			
		System Type	Roof Pitch	Siting	Maximum Height
		Roof mounted Solar Energy System	Pitch is greater than or equal to 3.2:12 (a fifteen (15) degree angle)	All districts	Roof-mounted Solar Energy Systems may extend up to one (1) foot above the roof surface on which the system is installed beyond applicable building height limits. Systems shall be surface-mounted and installed parallel to the roof surface.
		Roof-mounted Solar Energy System	Pitch is less than 3.2:12 (a fifteen (15) degree angle)	All districts	Roof-mounted Solar Energy Systems may extend up to three (3) feet above the roof surface on which the system is installed beyond applicable building height limits. If the surface on which the system is to be mounted is below maximum building height, the Roof-mounted Solar Energy System may extend up to six (6) feet above the roof surface on which the system is installed, provided it does not exceed building height limits by more than three (3) feet; and provided further that any Roof-mounted Solar Energy System that extends more than three (3) feet above the roof surface on which the system is installed must be installed at least three (3) feet from the roof’s edge.
		Other Building-mounted Solar Energy System (e.g., awnings)	Not Applicable	All districts	No greater than the highest point of the roof.
		2) Ground-mounted Solar Energy Systems:			
		System Type	Siting	Maximum Height	
		Small-Scale Ground-mounted Solar Energy System	All districts	Ten (10) vertical feet from grade.	
		Medium-Scale Ground-mounted Solar Energy System	All districts	Ten (10) vertical feet from grade.	

			Solar Parking Canopy	Residential	The maximum height allowed on the lot or the height of the principal structure, whatever is less.
			Solar Parking Canopy	Non-residential	Subject to site plan review by Special Permit Granting Authority.

	State Model By-Law	Needham Draft By-Law
Design Standards	1.3 Site Plan Review Design Standards 1.3.1 Standards for medium-scale ground-mounted solar energy systems proposed within residential zoning districts 1.3.1.1 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. 1.3.1.2 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider. 1.3.1.3 Safety - The medium-scale ground-mounted solar energy system owner or operator shall provide a copy of the Site Plan Review application to the local fire chief. All means of shutting down the solar installation shall be clearly marked. 1.3.1.4 Visual Impact – Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures. 1.3.1.5 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.	b) Site Plan Review Design Standards: The Special Permit Granting Authority shall consider the following criteria and standards, in addition to those listed in Section 7.4.6, Review Criteria for Site Plan Review when reviewing site plan submittals made under this section: 1) Utility Notification: No solar photovoltaic system shall be installed until evidence has been given to the Special Permit Granting 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) Utility Connections: Reasonable efforts, as determined by the Special Permit Granting Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider. 3) Safety: The owner or operator shall provide a copy of the Site Plan Review application to the Needham Fire Department and shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar installation shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation. 4) Height and Layout: The Special Permit Granting Authority shall also review the height and physical layout of the Solar Energy Systems, utility connections, and appurtenant infrastructure as it relates to the convenience and safety of emergency vehicles, private vehicles and pedestrian movement on the site. 5) Visual Impact: Reasonable efforts, as determined by the Special Permit Granting Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures. 6) Land Clearing, Soil Erosion and Habitat Impacts: Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and By-Laws. 7) Lighting: The Special Permit Granting Authority shall review the physical lighting of the site, including the methods of exterior lighting for convenience, safety and security within the site, and in consideration of impacts of neighboring properties and excessive light pollution. Where feasible, lighting of the Solar Energy System shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

Site Plan and Special Permit Approval	Example 1 (Site Plan Review provisions for medium-scale ground-mounted solar energy systems in residential zoning districts): 1.0 Site Plan Review 1.1 Applicability 1.1.1 Medium-scale ground-mounted solar energy systems proposed within residential zoning districts shall undergo Site Plan Review prior to construction, installation or modification as provided in this section. 1.2 Site Plan Document Requirements Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority: 1.2.1 A site plan showing: (a) Property lines and physical features, including roads, for the project site; (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures; (c) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector; (d) Documentation of the major system components to be used, including the panels, mounting system, and inverter; (e) Name, address, and contact information for proposed system installer; (f) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any; (g) The name, contact information and signature of any agents representing the project proponent; and (h) Zoning district designation for the parcel(s) of land comprising the project site. 1.2.2 Proof that the project proponent will meet the required Site Plan Review notification procedures.	a) Site Plan Review: Medium-scale Ground-mounted Solar Energy Systems in all districts and Solar Parking Canopies in non-residential districts are subject to site plan review by the Special Permit Granting Authority prior to construction, installation or modification as provided in this section and in accordance with Section 7.4 Site Plan Review. The Planning Board will serve as the Special Permit Granting Authority for these systems. 1) Site Plan Document Requirements: The project proponent shall provide a Final Site Plan to the Special Permit Granting Authority in compliance with Section 7.4 Site Plan Review, Subsection 7.4.4.Procedure. In addition, applicants should submit the following: i. Name, address, and contact information for proposed system installer. ii. Name, address, contact information and signature of the project proponent, as well as all co-proponents or property owners, if any. iii. The name, contact information and signature of any agents representing the project proponent. iv. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures. v. Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the Solar Energy System. vi. Documentation of the major system components to be used, including the panels, mounting system, and inverter. vii. Operation and Maintenance Plan including measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation. viii. Locations of active farmland, 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 Massachusetts Department of Environmental Protection (MassDEP) in relation to the site. ix. Locations of local or National Historic Districts in relation to the site.
---	---	--

First Energy-Positive Multi-story Office Building

When Bullitt Foundation President and CEO Denis Hayes was ready to build his organization's new headquarters, he set some very challenging goals. The six-story facility was to achieve Energy Positive and also meet all the requirements of the **Living Building Challenge** – a holistic set of restorative design criteria developed by the International Living Futures Institute that's far more demanding than **LEED Platinum**.

To qualify, a building must produce all of its own energy, harvest all of its own water, discharge nothing off-site, meet strict materials specifications along with requirements on Health, Equity and Beauty – see:

<http://plone.ilbi.org/lbc> The Foundation retained SDA to help them achieve these goals.



SDA collaborated with Seattle architects Miller | Hull and their consulting engineers to define the energy requirements and the solar harvest potential. Since the facility is located in photon-deprived Seattle, available sunlight was the major design driver.



After working with the design team to balance the energy equation - reducing loads to the lowest level possible – an EUI of 16, SDA concluded additional roof area beyond the building's footprint was essential to deliver sufficient annual solar harvest to achieve **energy positive** and proposed the solar array be cantilevered out over the public space on three sides surrounding the facility.

SDA provided full solar design and engineering, complete construction documents, procurement assistance, liaison with code and utility officials, construction oversight and full system commissioning. The Center received a **Top Ten Environmental Design Award** from the American Institute of Architects and the *New York Times* and *World Architecture* both declared the Bullitt Center to be **"The greenest and most efficient office building in the world"**. Take a video tour narrated by the client: <https://vimeo.com/57077446>

Solar for the University of California Medical Center

When Planners wanted to field solar electricity to power their University of California Medical Center in San Francisco, they retained SDA to help them accomplish their goal. The project presented many challenges: Roof real estate was already fully subscribed with mechanical systems essential to hospital operations, potential glare issues impacting the roof-top Medevac heliport and, the campus sits atop an active seismic zone.

The only option to field any significant amount of solar capacity was to install it on an elevated structure that clear-spans all roof-top equipment. SDA retained noted regional structural engineering firm Rutherford and Chekene to assist with seismic design and help develop a 'hardened' version of SDA's proprietary high-density, array mounting system together with the necessary supporting structure. Both had to meet the 2.5 X safety factors required by all hospitals in California.



The resulting array provides maximum solar potential from the space available while also maintaining sufficient slope for rainfall to keep the modules clean.

SDA served as Engineer-of-Record providing initial schematic system design, complete construction documents, procurement assistance, review of installation contractor's proposals, construction period support and comprehensive system commission. When completed, the system was the largest in the city.

Near-Net-Zero-Energy Academic Center

Clark University wanted their newest addition to campus to be as energy self-reliant as possible. They retained Architerra, a Boston area architectural firm well known for sustainable design and Architerra retained SDA known for innovative solar power solutions.

This being the first solar-powered building on campus, the University wanted to emphasize its energy credentials. The architects proposed to float the solar array on a trellis 10' above the roof and cantilever it out beyond the building. This provided the desired results, maximizing solar harvest while accommodating all rooftop equipment with easy access and full air circulation.

SDA collaborated closely with the design architects and developed a unique, integrated, solar array mounting system that maximizes solar harvest along with the structural interface to satisfy wind loading on the unique structure.

SDA served as Engineer-of-Record for the solar system providing full design and engineering, complete signed-and-sealed construction documents, procurement and permitting assistance, liaison with utility and code officials, construction oversight and full system commissioning. The project's General Contractor became concerned the custom solar system was beyond the capabilities of typical solar contractors after receiving only unresponsive proposals. SDA was engaged to construct the system and completed the project on a turn-key **design / build** basis.



First Net-Zero-Energy College Academic Laboratory

The new 60,000 ft² Allied Health Sciences Laboratory for the University of Massachusetts system was selected by Governor Patrick to be the first Net-Zero-Energy building constructed by the Commonwealth.

Solar Design Associates was retained to collaborate with design architects DiMella Shaffer Associates on what was their first **Net-Zero-Energy** commission.

SDA worked with the architects and their consulting engineers to help balance the energy equation to achieve Net-Zero for the facility and define the design requirements needed to achieve this goal.



SDA then designed the solar electric roof and companion solar walkway canopies to deliver the energy required to power the facility. Since the facility was already under construction, SDA designed a long-span truss system to clear span the roof and all roof-top equipment as it was not designed to accept the additional loading from the solar system. This approach also expanded the available roof area to accommodate the amount of solar required to achieve Net-Zero.

SDA provided full design and engineering and complete construction documents for the solar systems, assisted with procurement of key components, provided construction oversight, liaison with utility and code officials and commissioned the systems upon completion. When completed, the facility was one of the largest commercial / institutional buildings and one of the first laboratory facilities in the US to achieve Net-Zero-Energy status.

NEEDHAM PLANNING BOARD MINUTES

September 5, 2023

The Needham Planning Board meeting, held in the Charles River Room of the Public Services Administration Building and virtually using Zoom, was called to order by Adam Block, Chairman, on Tuesday, September 5, 2023, at 7:00 p.m. with Messrs. Crocker and Alpert and Mmes. McKnight and Espada, Planning Director, Ms. Newman and Assistant Planner, Ms. Clee.

Mr. Block took a roll call attendance of the Board members and staff. He noted this is an open meeting that is being held in a hybrid manner in public and remotely per state guidelines. He reviewed the rules of conduct for all meetings. This meeting does include one public hearing and public comment will be allowed. If any votes are taken at the meeting the vote will be conducted by roll call. All supporting materials, including the agenda, are posted on the town's website.

ANR Plan – Arthur Fine Homes, LLC, Petitioner, (Property located at 248 Harris Avenue and 96 Bradford Road, Needham, MA).

Mr. Block called out that on the site plan it says 284 and not 248. He asked why this is subdividing 63 square feet. Ms. Newman noted a neighbor wants to acquire that strip of land. A conveyance is the only issue being proposed here. She will clean up the transposed numbers on the mylar.

Upon a motion made by Ms. McKnight, and seconded by Mr. Crocker, it was by a vote of the five members present unanimously:

VOTED: with those corrections, to endorse the plan subdivision approval not required.

Jim Reulbach explained why the transfer is being done.

Public Hearing:

7:00 p.m. – Major Project Site Plan Special Permit No. 2023-03: Neehigh LLC, 93 Union Street, Suite 315, Newton Center, Petitioner (Property located at 629-661 Highland Avenue, Needham, Massachusetts). Regarding request to demolish the five existing buildings on the property and build a single two-story 50,000 square feet Medical Office Building (25,000 square feet footprint) with two levels of parking (one at-grade and one below grade) totaling two hundred and fifty (250) spaces.

Upon a motion made by Mr. Alpert, and seconded by Ms. McKnight, it was by a vote of the five members present unanimously:

VOTED: to waive the reading of the public hearing notice.

Mr. Alpert stated he wanted to be on record that Temple Beth Shalom is directly across the street from this project. He is General Counsel for the Temple and an Ex officio member of the Board of Trustees. He checked with Temple Beth Shalom and the Temple was served with notice and ~~are~~ considered an abutter of this property. He checked with the management at the Temple, and they have no position on this matter. He checked with Town Counsel and has filed paperwork with the Town Clerk. He wanted to be up front with the applicant in case they had an issue with him sitting on this matter. Attorney Evans Huber, representative for the applicant, stated he has no issue with Mr. Alpert participating in the hearings.

Mr. Huber stated the applicant is seeking site plan review. There are 5 existing buildings that will be demolished and replaced with one building. The new building will be a medical office building of 50,000 square feet and 2 stories. The 250 planned parking spaces meet the requirement for medical office. There will be one level of parking underground and one at grade level within the building. The applicant is not asking for any zoning relief as ~~the use~~ is allowed by law and meets all dimensional requirements. The applicant met with the abutters. The applicants ~~is-are~~ aware of their concerns and

has~~ve~~ taken them into account. Jonathan Cocker, of Mangel Destefano Architects, showed the existing site plan and discussed what was proposed. He noted there is presently very limited green space and a lot of pervious surface. There is parking on Cross Street and Arbor Street. The buildings are right along Highland Avenue. All the buildings will be torn down and one building will be built near the center of the site. There is a ~~350~~320 square foot reduction in building footprint and a 13,000 square foot reduction in paved area. There will be an increase of approximately 12,000 square feet of green space between the building and the streets.

Mr. Cocker noted 25% ~~of~~ the parking is surface parking. The rest is below grade concealed within the slope of the site. He showed the grading on site. A sidewalk and green space are being created. There will be a 2-story office building with a level of parking, then another parking story below that. There will be an accessible sidewalk from the corner to get into the building. Entering the building will be through an elevator lobby. Ms. Espada asked if that will be the main entrance and was informed it will be the main entrance to the building. Deliveries will be going in through that entry. Trucks and ambulances can access here also. There will be green space in a patio area. An access drive has been created at the end of Cross Street to Arbor Street and it will be softened with landscaping. There will be landscaping all along Arbor Street. Added features include a retaining wall and screening to prevent head-lights from shining on adjacent residents. There will be 3 drive aisles. All else is screened. He noted the lower level of the parking garage can be accessed from Arbor Street or Cross Street.

Mr. Cocker noted some roof top equipment will be screened and located toward the rear of the site. A lot of landscaping is being added along Highland Avenue as the building is pushed back from the road. The materials include sleek modern glass and white aluminum composite panels. There will be screening at the top and down at the parking level. Sunshades go as an eyebrow across the second story of the building. He noted the lowest level of parking has entry from Cross Street and Arbor Street. The upper level has one access off Cross Street with accessible parking in the middle with a lobby and loading zone. There is also access out to Arbor Street at the rear. A pad for the transformer is at the rear of the site and will be screened. All traffic will be 2-way and will be disbursed in both directions.

Mr. Block stated he was concerned that pedestrians have to cross 3 lanes of traffic to get to the lobby. He feels it should be flipped so the lobby is near the entrance. Mr. Cocker noted the reason for doing that is the need to have the egress directly to the outside of the building. The location of the lobby in the center allows better disbursement of occupants and tenants from the site. Colbi Cavanaugh, of Mangel Destefano Architects, stated it has been flipped a couple of times and this is the best outcome. Mr. Cocker noted the site will be lit for safety. Lighting is being kept to a minimum with downward facing light compliant light fixtures. There will be zero light spillage to neighboring properties. Against the building are W1 wall mount fixtures and G12 within the garage. Lights are being provided for parking and walkways via handrail lights. Mr. Block asked what time the lights will go off. Mr. Cocker noted lighting for security is needed but the hours will be compliant with the Town requirements.

Jeffrey Dirk, managing partner at Vanasse & Associates, Inc., prepared a Transportation Impact Assessment using the ~~T~~own standards and Mass DOT standards. He worked with ~~T~~own departments ~~within the town~~ to understand the roadway structure current and future. The Muzi site was taken into account. The critical thing was disbursing traffic and traffic moving on Arbor Street and Cross Street. About 55% of traffic goes to I-95 so they have looked at left turn queueing. Arbor Street and Cross Street will have 1 to 5 cars queueing during peak time. He looked at how the garages were designed and saw no safety deficiencies. The sight line exceeds the recommended sight lines. He noted some traffic will be on Hunting Road and Gould Street but the majority will go to I-95. He showed the existing conditions. Bike lanes have recently been added. He wanted to design the project so people could bike and walk safely. He noted there will be 20,000 cars per day over a 24-hour period with 1,700 cars at peak hours on Highland Avenue.

Ms. Espada asked why the entrance is on Cross Street where there are residences and not on Arbor Street where it is commercial. Mr. Dirk noted, from a traffic standpoint, either one would work. For disbursal, Cross Street is better. He noted people will likely use the first ~~street~~ they come to. Signs can be provided to encourage people to use one street over the other. Mr. Cocker noted people could access Arbor Street or Cross Street from the garage. Mr. Dirk showed vehicle trips. There will be 1,800 daily in 24 hours. There are 634 existing and there will be 1,166 for medical office. There will be 101 in the morning peak and 168 in the evening peak. Mr. Alpert asked the hours of operation. Mr. Huber assumes the hours will be 7:00 a.m. to 7:00 p.m.

Mr. Dirk showed the trip disbursement and noted it was designed using both streets. Mr. Block asked what the maximum capacity for queueing is before disruption. Mr. Dirk stated it could go to 10 cars on both streets before disruption. That is substantially more than what they are predicting. He noted the following recommendations: traffic signal retiming and phasing plans on either side of the project site at Highland and Webster, and Highland and Gould and Hunting, and install signs for No Through Traffic on Cross ~~Street and Highland~~ at Putnam ~~Street~~. Mr. Alpert asked if the timing could be done so there is a break in traffic at the same time so cars can get out. Mr. Dirk stated that could be done.

Formatted: Not Highlight

Justin Mosca, Civil Engineer, reviewed the stormwater management and topography plan. The site has a comprehensive storm water management system design in compliance with the Needham Stormwater By-Law and associated standards. It does not connect to the ~~Town~~ system. Highland Avenue is the high side and there is no useful connection. They rely heavily on infiltration. Enough infiltration volume is being provided for a fully managed 25-year storm and a mostly managed 100-year storm with some overflow but less than what is there today. Catch basins are set up all along Arbor Street along the frontage and along Highland Avenue. All water from the building and parking area are going to the infiltration system. Inside the building are concrete chambers and outside is the infiltration system.

Formatted: Not Highlight

Mr. Mosca noted most of the connections for the general utilities are off Cross Street such as electric and gas. Sanitary sewer is out to Highland Avenue. There is a water line on Arbor ~~Street~~ for a new hydrant. He showed where the generator will be located. He noted the applicant is funding stormwater improvements on the ~~3Three~~ Squares Restaurant property as the system was not working. Ms. Cavanaugh noted the green space is increased by ½ acre of open space overall. There is a 40-foot setback of green space along Highland Avenue and green space along all the sides. Retaining walls are all under 4 feet in height and have been planted. There will be significant screening along Cross Street with additional plantings at the neighbor-~~s~~' property across from Arbor. The property will be irrigated. There will be a 2,500 square foot plaza for patients and workers which will be screened. It will be flexible open space and screened with arborvitae. There will be a terrace and plantings within the parking area. Additional trees are being planted along Arbor and ornamental trees and grasses along the terrace. There will be 4 different grasses along the front, then a wall with more plantings above. The plantings will all be low maintenance.

Ms. McKnight noted a good locus plan is missing from the packet. The plan does not identify all the streets that go from Gould Street to Webster Street. Mr. Block noted the following correspondence for the record: a memo from the Design Review Board, dated 8/8/23, with comments regarding red oaks, approving the building design and materials; an email from Police Chief John Schlittler, dated 8/15/23, regarding traffic impact; a response to Chief Schlittler from Jeffrey Dirk, dated 8/31/23; an email from Assistant Public Health Director Tara Gurge, dated 8/30/23, with the usual comments; a letter from Town Engineer Thomas Ryder, dated 8/30/23, with comments; a letter from Building Commissioner Joe Prondak, dated 8/31/23, with comments; a letter in response to Mr. Prondak's comments from Daniel Burton, dated 8/31/23; an email from Fire Chief Tom Conroy, dated 8/30/23, with comments; a response to Mr. Conroy from Justin Mosca, dated 8/30/23 and an email from Town Meeting member Glenn Mulno, dated 8/31/23, with comments.

Formatted: Not Highlight

Mr. Block opened the hearing up for public comment. Attorney Howard Freedman, representative for Gateway Townhouse Condominiums at 605-607 Highland Avenue, noted the units were built in 1996. There are 12 units, with children, and there is a concern with traffic. ~~Cross Street~~The road is congested but well maintained. There is a concern with traffic on Putnam Street. This project will be adding 1,100 new cars daily. There is concern with signage and enforcement. He feels the issues will be ongoing. Cross Street and Arbor Street are private ways so people who abut the roads need to maintain them. He would like to know the developer's contributions. Mr. Block suggested Mr. Freedman email a list of comments to the Planning Board.

Jennifer Yogel, of 612 Highland Avenue, lives directly across the street, between Mills and Utica. It is very densely populated with a lot of children who play in the streets. She is very concerned with the safety of the kids. Cut throughs will happen. It is done all the time at high speeds. She asked why there is not another access route out of the neighborhood onto Webster or Gould. She asked how medical waste is leaving these places. It is a very sticky situation with storage outside. Flooding has impacted this area of town like she's never seen before, and she is concerned with pests that get into trash, water, waste removal and traffic. She appreciates the traffic counts, but they have never tried to get in or out of their driveways onto Highland Avenue. The project needs more work on the road systems and access. People should enter and exit different ways.

Walter Tin, Trustee of Townhouse Condominium~~community~~, backed up the comments that were made. The biggest problem is the width of the streets. There are no sidewalks and kids are a real issue. These are private ways, and the community pays for all expenses. Dr Wendy Herman, of 613 Highland Avenue, Gateway Condos, has 2 small kids. The bus stop is at Cross and Highland. Her first grader is allowed to be picked up and dropped off independently. She would like to keep that available as a bus stop and ensure safety. Mr. Alpert asked how safety at the bus stop would be impacted during construction. Mr. Huber stated he would respond at the next meeting.

Rob Dengel, of 28 Hewitt Circle, feels badly for the condo owners with Muzi, Wingate, and now this. It is sandwiched from all sides. The size of the project needs to be taken into consideration. The narrow streets will not be able to handle traffic and he heard nothing about solar. Is there anything regarding LEED Certified for the building? It seems like a ~~non description-non-descript~~ building and ~~does~~would not contribute to the character of Needham. He does not feel the focus was on aesthetics and traffic impacts. He wants the Board to think about the neighbors.

Mr. Alpert noted this is a project with a use that is as of right and meets all requirements. He wants to ask Town Counsel if, on a site plan review, can the Board raise these issues such as solar. He would like an answer from Town Counsel. Mr. Block stated he spoke with Town Counsel specifically on solar. It is clear under site plan authority the Board does not have authority to require solar or carbon technology. The Board does not have the discretion to require the developer to reduce the building size. The developer needs to mitigate the impacts and leave it not in a worse state post construction and there are certain standards to meet traffic mitigations. Mr. Dengel stated if the developer is not required by law to address these issues, the zoning should be looked at so the Town can have more power. Mr. Alpert noted there is a plan to identify specific By-Law changes for solar and solar technology.

David Hruska, of 21 Rosemary Street, stated it is a nice development. He is concerned with parking, particularly the cost to park there. He assumes parking will be free but there will be a lot of extended costs on the public. He wants to encourage planning for the future and reduce dependence on vehicles. They should reduce the parking and charge the market rate for parking. Nancy Greenwald, of 615 Highland Avenue and Trustee of Townhouse Condominiums, reiterated what the others have said. She would like "no access to Highland" signs on Putnam Street. 250 cars parking on this site~~there~~ are too many. She has problems getting out of her driveway in the morning as traffic backs up to her driveway. She does not feel 7:00 a.m. to 7:00 p.m. are appropriate hours. There are homes in the area. She feels 4:30 p.m. should be the last appointment.

Emily Pick, of 12 Mills Road, stated her biggest concern is traffic. She hopes the Planning Board hears the concerns. She would like to see this pushed back off Highland Avenue, more traffic disbursement and more water management. The hours of operation should be addressed. Curtailing the hours would minimize traffic. Mills Road is a cut through. She would like some mitigations put in and would like to see some method of enforcement on Highland Avenue. People speed on Highland Avenue. She would like the hours of construction minimized and is concerned with the scale of the project.

Kevin Pichetti, of 194 Webster Street, asked how many more cars there would be. Mr. Cocker noted there would be roughly 60 more vehicles in and out for 120 more vehicle trips. Mr. Pichetti asked, with the elevation change to Arbor Street, how is that going to work. Mr. Cocker stated Arbor is already a little higher than Cross Street. There will be a connecting driveway between the 2 roads. Mr. Pichetti stated there are 6 oaks on Arbor Street. Mr. Cocker noted there is a plan to remove one that is not healthy.

Ben Daniels, of 5 Sachem Road, lives across from the Muzi site. With the traffic, where does this all end? This is 1,100 more cars per day and there will be more with the Muzi property. He noted it is frustrating that it is just a little bit at a time. There is no ~~long-range~~long-range plan. There has to be a plan, not who gets there first. They need someone to keep an eye that Needham does not turn into Somerville. The developer could put up solar or geothermal as a matter of good will.

Alan Freidman, of 71 Putnam Street, noted signs can be put up but they will not matter. There are a lot of kids. The impact with this development, Wingate and the Muzi site is awful. The Planning Board represents the residents and should not just ok all this. Mr. Block stated there could be a peer review on traffic impact analysis. Ms. McKnight stated they usually require it. Mr. Crocker noted traffic is the main focal point. He feels it would be wise to do the peer review. Ms. Espada agreed. Mr. Alpert is in favor of a peer review. Vanasse does good work but represents the developer; ~~1. - A~~ another set of eyes would be good. Ms. Newman stated GPI could do the peer review.

A motion was made to ask the Planning Director to reach out to GPI as they are available and request a traffic study peer review and engage a consultant. Ms. Newman noted she would work with GPI to get a proposal, cost and timeline. This would be needed for the 10/3/23 meeting. Mr. Alpert feels it should be stressed that the major concern is with traffic on small side streets and how to mitigate it.

Upon a motion made by Mr. Alpert, and seconded by Mr. Crocker, it was by a vote of the five members present unanimously:

VOTED: to ask the Planning Director to reach out to GPI and request a traffic study peer review and engage a consultant.

Upon a motion made by Mr. Alpert, and seconded by Ms. McKnight, it was by a vote of the five members present unanimously:

VOTED: to continue the hearing to 10/3/23 at 7:05 p.m.

Board of Appeals – September 21, 2023.

1458 Great Plain Avenue – Tobin Beaudet Schools, Inc.

Upon a motion made by Mr. Alpert, and seconded by Ms. McKnight, it was by a vote of the five members present unanimously:

VOTED: “No comment.”

Minutes

The minutes will be discussed at the next meeting.

Report from Planning Director and Board members.

Ms. Newman noted there will be a kickoff meeting for the Housing Needham (HOMNE) Committee Advisory Group this Thursday at 7:00 p.m. RKP Consultants have been hired and the paperwork has been signed. She feels the Planning Board members should review the tape of the meeting to be up to date. There will be a presentation on the MBTA Communities Act and what is expected. There will be a discussion about the public process.

Ms. Espada noted she did not see regulations for the streetscape along the Highland Avenue area they just looked at. Ms. Newman stated it is such regulations are not provided in the Industrial District. She tried to rezone it shortly after she arrived in 1993 and it was unsuccessful. Ms. McKnight stated, in the Town's 2022 Housing Plan, proposals for rezoning in compliance with the MBTA law it went to Webster Green Apartments and stopped because, beyond Webster Street, it is not transit oriented. The standard is ½ mile or a 15-minute walk to transit. Mr. Alpert noted they are dealing with an Industrial zone in the middle of a residentially-zoned area. Ms. Espada just wants members to be mindful of different lots with different setbacks. Mr. Alpert noted they are talking about the Highland Avenue corridor. He likes that this project is not directly on Highland Avenue and but has a 40-foot landscape buffer along Highland Avenue. It is not all asphalt like on Gould Street and from Webster to Gould. This will add some class to this section of town.

Ms. Espada noted she and Ms. McKnight plan a once-a-month meetings for the HOMNE committee, with committee community meetings in October, January and March. Ms. Newman stated the first community meeting will be 11/9/23. Mr. Block noted there are 3 candidates for the Economic Development Director position. He was on the search committee. The Assistant Town Manager Katie King will hold a second round. He will keep members posted of any vacancies for CEA members. He noted the Single Parcel Historical Commission will do reports to the Planning Board.

Correspondence

Mr. Block noted the following correspondence for the record: an email from Anika Law, dated 8/17/23, regarding a By-Law change for regulating gun shops; an email from Stanley Keller, dated 8/28/23, relating to 1688 Central Avenue; an email from Norman MacLeod, dated 8/29/23, regarding 1688 Central Avenue; an email from Gregg Darish, dated 8/29/23,

regarding 1688 Central Avenue; an email from Lois Sockol, dated 8/29/23, regarding 1688 Central Avenue; an email from Robert and Joan Onofrey, dated 8/30/23, regarding 1688 Central Avenue and a public notice from Wellesley regarding Large House Construction.

The Board took a 5-minute recess.

Zoning Regulation of Solar Energy Systems: Material Review, Zoning Priorities and Policy Considerations.

Mr. Block stated, for the May Town Meeting, he wants to define the scope, identify action items and a schedule to move forward. The Climate Action Plan Committee (CAPC) is focused on 3 areas – solar canopies over parking lots and structures; commercial roof top solar; and small and medium sized ground-based solar. The first element in the By-Law is the purpose in any section. He will follow the same structure as other By-Laws. The framework will be around the 3 items above, but they need to identify what the process will be. Should canopies over parking lots and structures be by right or by special permit? Some advocate breaking up by size. Some recommend solar canopies by size and smaller canopies would be by right. Large, like the Boston Properties Special Permit, he would prefer by site plan review. He needs to see what the standard is. He does not know what the potential adverse effects would be and appropriate mitigation. The 888 Great Plain Avenue size would be like a small installation. He feels it could go through without site plan review. They need to know what the standard is by size.

Mr. Alpert hears the discussion as if the developer comes to the Board and wants to put solar in. He thought they were talking about where the Board can require solar. Mr. Block does not feel it needs to be a special permit process, just site plan review. Ms. Newman commented if there is already a special permit for the building, some canopies have been done as de minimus changes to the special permit. Ms. Espada stated she was at a CAPC meeting with Justin Savignano, and Steven Frail and 2 experts were brought in – Andrea Love and Jacob Knolls. They were part of the group that created the Stretch Code. This group came up with recommendations for different items already sent to the Planning Board. She read what was sent. A framework was already put together. She feels they could start with that. Mr. Block noted they could take that and focus on the solar elements.

Ms. Espada feels one thing is reviewing permitting online. Mr. Block stated they can identify what the permitting process is and add an application for solar canopies. They need information from Mr. Savignano as to the size that will tell what can be done by right. A discussion ensued regarding solar canopies. Mr. Block asked Ms. Newman to bring up the size of the Olin project and the Boston Properties parking garage for the next meeting. Ms. Newman clarified they could identify the size of what can be built over a structure by right and by special permit. Mr. Block recommends that, if it is a by-right structure it would be a by-right process. If a certain size it would be by right but with site plan review. Ms. Newman noted the same rules should be in all districts. Mr. Block was thinking not of different regulations by district but by size.

Ms. McKnight feels it is primary use versus accessory uses. There are tables of what is allowed as primary and accessory uses. They could have a footnote. She feels they should go district by district to see where this use should be allowed. Mr. Block reiterated he feels the standard is the size. Mr. Alpert noted the difference is that the size that would be allowed in Needham Center is smaller than the size that would be allowed in the Industrial District. A discussion ensued. Mr. Block noted there is no structured parking in downtown where this would be applicable. All buildings in downtown are small buildings. It would factor it in by size. It would need a definitional change throughout the By-Law to define what solar canopies should be. Ms. McKnight stated the Board needs to set what the criteria would be. Mr. Crocker stated a solar canopy is a structure. They may not need to have any regulator~~regulation~~thing other than compliance with the existing setback. The Board needs to determine if it is fair, practical and right. Mr. Block stated that is not relevant. The structure is not a solar canopy. The structure is the parking structure. Solar on roofs could be anywhere in town. The Board discussed the need to identify sites, understand how much is realistic for what buildings, look at the setback and see what other towns have done. Mr. Alpert noted the information provided by Steven Frail has By-Laws from other towns. Ms. Newman intends to look through and put together the information with a chart with all the elements.

Mr. Block summarized the discussion. The high-level items are commercial roof top solar, solar canopies over parking lot structures and small and medium ground based solar. The height and setback restrictions need to be separated out. Solar and other carbon reduction technology should be allowed and mechanicals not to exceed 15 feet on the horizontal plane and 25% of rooftop criteria. They need to look at structure setback and screening requirements. The process should be

Formatted: Underline

Formatted: Underline

considered, identity definitions and what is being mitigated~~ing~~ for. The Dover Amendment is a protected use under Chapter 40A, Section 3. He feels they need to bring Town Counsel in at the early end. Ms. Espada stated Mr. Savignano and the new Building Commissioner should be at the next meeting. She noted the Stretch Code needs to be abided by. The Board needs to be aware of that and take it into account.

Upon a motion made by Mr. Alpert, and seconded by Ms. Espada, it was by a vote of the five members present unanimously:

VOTED: to adjourn the meeting at 10:35 p.m.

Respectfully submitted,
Donna J. Kalinowski, Notetaker

~~Jeanne S. McKnight~~ Natasha Espada, Vice-Chairman and Clerk

From: [Ross Donald](#)
To: [Planning](#); [Amy Haelsen](#)
Cc: [Ross Donald](#)
Subject: Questions about Public Hearings Code of Conduct
Date: Wednesday, November 22, 2023 12:46:34 PM

Dear Planning Chair and Members,

Please, enter this correspondence into the record, if you would, for possible discussion on November 28, before the NHA Hearing on December 6.

I am a former Town Meeting Member and have observed with fascination the work of the Planning Department and the various other committees that have been meeting for so many years. I have a special interest in the Linden/Chambers proposals, since I am a Tenant there.

The Planning Committee, and the other Town Committees, have demonstrated an impressively professional relationship, working with the Needham Housing Authority, in such a friendly and accommodating way. When the NHA is granted time on your Agenda, for the many "informal" chats, the appearance is that the Planning, Zoning, and Conservation Committees are partners, in whatever the NHA is proposing.

NHA, admittedly, wants to borrow the "gravitas" of the Planning Board. This has been one goal of the NHA (to gain political concurrence) starting in 2017, after a strategic planning session with the State. I can elaborate on that, if the Rules allow. I can, for instance, address the question posed to NHA by the Planning Chair, "Why the density? Where did this come from?"

Will the following guidelines from NHA be in effect? Or will you have your own Rules?

"Guidelines for Public Comment Period And Public Hearings at the Needham Housing Authority

The presiding officer has discretion in enforcing these guidelines for the orderly and civil conduct of public meetings. The guidelines below apply to both the public comment period and public hearings before the Board unless noted otherwise.

1 Public comment period is provided at the discretion of the Needham Housing Authority.

2. Sign-up sheets for speaking during the public comment period and public hearings will be available 15 minutes before the start of the meeting. Citizens may not sign up on behalf of others. Citizens may indicate their desire to speak by email or mail at least 5 days prior to the meeting. Comments may also be entered via mail or email.

3. For the public comment period, each speaker is allowed three minutes, unless time is extended by the presiding officer. The public comment period may be limited to 15 minutes. A time limit may be imposed for individual testimony at a public hearing

4. Meeting attendees may not "donate" their speaking time to another person.

5. Speakers are not permitted to comment during the public comment period on topics that are scheduled to come up later as a public hearing item.

6. All remarks should be addressed to the NHA Board as a whole, through the Chairperson.

7 Speakers shall refrain from comment or behavior that involves:

a. Disorderly speech or action; name-calling or personal attacks; obscene or indecent remarks; and derogatory comments on personalities;

b. Comments must not reference other NHA residents individually, by family, or address

c. Promoting candidates for public office or upcoming ballot measures is not permitted.

8. Any person who engages in speech or action as described in Section 7, when such speech or action disrupts, disturbs or otherwise impedes the orderly conduct of any NHA Board meeting, may, at the discretion of the presiding officer, be barred from further audience before the Board during that meeting. (sic)

9. Any person who engages in speech or action as described in Sections 7 may, at the discretion of the presiding officer, be barred from further audience before the Council during that meeting. (sic)

10. In addition to the limits specified above, the presiding officer may set other reasonable, viewpoint-neutral limits to prevent disruption of NHA Board business.

Thanks for all your good work.

Yours truly,
Ross

Editor of [The Linden Letter](#) the.linden.letter@gmail.com
25 H Chambers Street, Needham, MA 02492-2140
Ross M. Donald 339-225-2620 ross.m.donald@gmail.com

Guidelines for Public Comment Period And Public Hearings at the Needham Housing Authority

The presiding officer has discretion in enforcing these guidelines for the orderly and civil conduct of public meetings. The guidelines below apply to both the public comment period and public hearings before the Board unless noted otherwise.

1. Public comment period is provided at the discretion of the Needham Housing Authority.
2. Sign-up sheets for speaking during the public comment period and public hearings will be available 15 minutes before the start of the meeting. Citizens may not sign up on behalf of others. Citizens may indicate their desire to speak by email or mail at least 5 days prior to the meeting. Comments may also be entered via mail or email.
3. For the public comment period, each speaker is allowed three minutes, unless time is extended by the presiding officer. The public comment period may be limited to 15 minutes. A time limit may be imposed for individual testimony at a public hearing.
4. *Meeting attendees may not "donate" their speaking time to another person.*
5. Speakers are not permitted to comment during the public comment period on topics that are scheduled to come up later as a public hearing item.
6. All remarks should be addressed to the NHA Board as a whole, through the Chairperson.
7. Speakers shall refrain from comment or behavior that involves:
 - a. Disorderly speech or action; name-calling or personal attacks; obscene or indecent remarks; and derogatory comments on personalities;
 - b. Comments must not reference other NHA residents individually, by family, or address
 - c. Promoting candidates for public office or upcoming ballot measures is not permitted.
8. Any person who engages in speech or action as described in Section 7, when such speech or action disrupts, disturbs or otherwise impedes the orderly conduct of any NHA Board meeting, may, at the discretion of the presiding officer, be barred from further audience before the Board during that meeting.
9. Any person who engages in speech or action as described in Sections 7 may, at the discretion of the presiding officer, be barred from further audience before the Council during that meeting.
10. In addition to the limits specified above, the presiding officer may set other reasonable, viewpoint-neutral limits to prevent disruption of NHA Board business.