

4.16. Wind Turbine Overlay District (4/9/07 ATM, Article 37; Amended 4/5/08 ATM, Article 20)

4.16.1.0. Purpose The purpose of this by-law is to provide by special permit for the construction and operation of wind facilities and to provide standards for the placement, design, construction, monitoring, modification and removal of wind facilities that address public safety, minimize impacts on scenic, natural and historic resources of the city or town and provide adequate financial assurance for decommissioning.

4.16.1.1. Applicability This section applies to all utility-scale and on-site wind facilities proposed to be constructed after the effective date of this section. It does not apply to single stand-alone turbines under 60 kilowatts of rated nameplate capacity. Any physical modifications to existing wind facilities that materially alters the type or increases the size of such facilities or other equipment shall require a special permit.

4.16.2.0. Definitions

4.16.2.1. Utility-Scale Wind Facility: A commercial wind facility, where the primary use of the facility is electrical generation to be sold to the wholesale electricity markets.

4.16.2.2. On-Site Wind Facility: A wind project, which is located at a commercial, industrial, agricultural, or institutional facility that will consume more than 50% of the electricity generated by the project on site.

4.16.2.3. Municipal Wind Facility: A project initiated by the local government whose primary purpose is to provide power for municipal uses.

4.16.2.4. Height: The height of a wind turbine measured from natural grade to the tip of the rotor blade at its highest point, or blade-tip height.

4.16.2.5. Rated Nameplate Capacity: The maximum rated output of electric power production equipment. This output is typically specified by the manufacturer with a "nameplate" on the equipment.

4.16.2.6. Special Permit Granting Authority: The special permit granting authority shall be the zoning board of appeals as designated by zoning by-law for the issuance of special permits, or by this section for the issuance of special permits to construct and operate wind facilities.

4.16.2.7. Substantial Evidence: Such evidence as a reasonable mind might accept as adequate to support a conclusion.

4.16.2.8. Wind Facility: All equipment, machinery and structures utilized in connection with the conversion of wind to electricity. This includes, but is not limited to, transmission, storage, collection and supply equipment, substations, transformers, service and access roads, and one or more wind turbines.

4.16.2.9. Wind Monitoring or Meteorological Tower: A temporary tower equipped with devices to measure wind speeds and direction, used to determine how much wind power a site can be expected to generate.

4.16.2.10. Wind turbine: A device that converts kinetic wind energy into rotational energy that drives an electrical generator. A wind turbine typically consists of a tower, nacelle body, and a rotor with two or more blades.

4.16.3.0. General Requirements

4.16.3.1. Special Permit Granting Authority No wind facility over 60 kilowatts of rated nameplate capacity shall be erected, constructed, installed or modified as provided in this section without first obtaining a permit from the special permit granting authority. The construction of a wind facility shall be permitted in any zoning district subject to the issuance of a Special Permit and provided that the use complies with all requirements set forth in sections 3, 4, 5 and 6. All such wind energy facilities shall be constructed and operated in a manner that minimizes any adverse visual, safety, and environmental impacts. No special permit shall be granted unless the special permit granting authority finds in writing that:

- (a) the specific site is an appropriate location for such use;
- (b) the use is not expected to adversely affect the neighborhood;
- (c) there is not expected to be any serious hazard to pedestrians or vehicles from the use;
- (d) no nuisance is expected to be created by the use; and
- (e) adequate and appropriate facilities will be provided for the proper operation of the use.

Such permits may also impose reasonable conditions, safeguards and limitations on time and use and may require the applicant to implement all reasonable measures to mitigate unforeseen adverse impacts of the wind facility, should they occur.

Wind monitoring or meteorological towers shall be permitted in all zoning districts subject to issuance of a building permit for a temporary structure and subject to reasonable regulations concerning the bulk and height of structures and determining yard-size, lot area, setbacks, open space, parking, and building coverage requirements.

4.16.3.2. Compliance with Laws, Ordinances and Regulations The construction and operation of all such proposed wind facilities shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, environmental, electrical, communications and aviation requirements.

4.16.3.3. Proof of Liability Insurance The applicant shall be required to provide evidence of liability insurance in an amount and for a duration sufficient to cover loss or damage to persons and structures occasioned by the failure of the facility.

4.16.3.4. Site Control At the time of its application for a special permit, the applicant shall submit documentation of actual or prospective control of the project site sufficient to allow for installation and use of the proposed facility. Documentation shall also include proof of control over setback areas and access roads, if required. Control shall mean the legal authority to prevent the use or construction of any structure for human habitation within the setback areas.

4.16.4.0. General Siting Standards

4.16.4.1. Height Wind facilities shall be no higher than 400 feet above the current grade of the land, provided that wind facilities may exceed 400 feet if:

- (a) the applicant demonstrates by substantial evidence that such height reflects industry standards for a similarly sited wind facility;
- (b) such excess height is necessary to prevent financial hardship to the applicant; and
- (c) the facility satisfies all other criteria for the granting of a special permit under the provisions of this section.

4.16.4.2. Setbacks Wind turbines shall be set back a distance equal to 1.5 times the overall blade tip height of the wind turbine from the nearest existing residential or commercial structure and 100 feet from the nearest property line and private or public way.

4.16.4.2.1. Setback Waiver The special permit granting authority may reduce the minimum setback distance as appropriate based on site-specific considerations, if the project satisfies all other criteria for the granting of a special permit under the provisions of this section.

4.16.5.0. Design Standards

4.16.5.1. Color and Finish The special permit granting authority shall have discretion over the turbine color, although a neutral, non-reflective exterior color designed to blend with the surrounding environment is encouraged.

4.16.5.2. Lighting and Signage

4.16.5.2.1. Lighting Wind turbines shall be lighted only if required by the Federal Aviation Administration. Lighting of other parts of the wind facility, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties.

4.16.5.2.2. Signage Signs on the wind facility shall comply with the requirements of the town's sign regulations, and shall be limited to:

- (a) Those necessary to identify the owner, provide a 24-hour emergency contact phone number, and warn of any danger.
- (b) Educational signs providing information about the facility and the benefits of renewable energy.

4.16.5.2.3. Advertising Wind turbines shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the wind energy facility.

4.16.5.2.4. Utility Connections Reasonable efforts shall be made to locate utility connections from the wind facility 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.

4.16.5.3. Appurtenant Structures All appurtenant structures to such wind facilities shall be subject to reasonable regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other and shall be contained within the turbine tower whenever technically and economically feasible. Structures shall only be used for housing of equipment for this particular site. Whenever reasonable, structures should be shaded from view by vegetation and/or located in an underground vault and joined or clustered to avoid adverse visual impacts.

4.16.5.4. Support Towers Monopole towers are the preferred type of support for the Wind Facilities.

4.16.6.0. Safety, Aesthetic and Environmental Standards

4.16.6.1. Emergency Services The applicant shall provide a copy of the project summary and site plan to the local emergency services entity, as designated by the special permit granting authority. Upon request the applicant shall cooperate with local emergency services in developing an emergency response plan.

4.16.6.1.1. Unauthorized Access Wind turbines or other structures part of a wind facility shall be designed to prevent unauthorized access.

4.16.6.2. Shadow/Flicker Wind facilities shall be sited in a manner that minimizes shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on neighboring or adjacent uses through either siting or mitigation.

4.16.6.3. Noise The wind facility and associated equipment shall conform with the provisions of the Department of Environmental Protection's, Division of Air Quality Noise Regulations (310 CMR 7.10), unless the Department and the Special Permit Granting Authority agree that those provisions shall not be applicable. A source of sound will be considered to be violating these regulations if the source:

- (a) Increases the broadband sound level by more than 10 dB(A) above ambient; or
- (b) Produces a "pure tone" condition – when an octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment hours. The ambient may also be established by other means with consent from DEP. An analysis prepared by a qualified engineer shall be presented to demonstrate compliance with these noise standards.

The special permit granting authority, in consultation with the Department, shall determine whether such violations shall be measured at the property line or at the nearest inhabited residence.

4.16.6.4. Land Clearing, Soil Erosion and Habitat Impacts Clearing of natural vegetation shall be limited to that which is necessary for the construction, operation and maintenance of the wind facility and is otherwise prescribed by applicable laws, regulations, and ordinances.

4.16.7.0. Monitoring and Maintenance

4.16.7.1. Facility Conditions The applicant shall maintain the wind facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief and Emergency Medical Services. The project owner shall be responsible for the cost of maintaining the wind facility and any access road, unless accepted as a public way, and the cost of repairing any damage occurring as a result of operation and construction.

4.16.7.2. Modifications All material modifications to a wind facility made after issuance of the special permit shall require approval by the special permit granting authority as provided in this section.

4.16.8.0. Abandonment or Decommissioning

4.16.8.1. Removal Requirements Any wind facility which has reached the end of its useful life or has been abandoned shall be removed. When the wind facility is scheduled to be decommissioned, the applicant shall notify the town by certified mail of the proposed date of discontinued operations and plans for removal. The owner/operator shall physically remove the wind facility no more than 150 days after the date of discontinued operations. At the time of removal, the wind facility site shall be restored to the state it was in before the facility was constructed or any other permitted use. More specifically, decommissioning shall consist of:

- (a) Physical removal of all wind turbines, structures, equipment, security barriers and transmission lines from the site.
- (b) Disposal of all solid and hazardous waste in accordance with local and state waste disposal regulations.
- (c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The special permit granting authority may allow the owner to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

4.16.8.2. Abandonment Absent notice of a proposed date of decommissioning, the facility shall be considered abandoned when the facility fails to operate for more than one year without the written consent of the special permit granting authority. The special permit granting authority shall determine in its decision what proportion of the facility is inoperable for the facility to be considered abandoned. If the applicant fails to remove the wind facility in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town shall have the authority to enter the property and physically remove the facility.

4.16.8.3. Financial Surety The special permit granting authority at a date certain shall require the applicant for utility scale wind facilities to provide a form of surety at a date certain, either through escrow account, bond or otherwise, to cover the cost of removal in the event the town must remove the facility, of an amount and form determined to be reasonable by the special permit granting authority, but in no event to exceed more than 125 percent of the cost of removal and compliance with the additional requirements set forth herein, as determined by the applicant. Such surety will not be required for municipally or state-owned facilities. The applicant shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include a mechanism for Cost of Living Adjustment.

4.16.9.0. Term of Special Permit A special permit issued for a wind facility shall be valid for 25 years, unless extended or renewed. The time period may be extended or the permit renewed by the special permit granting authority upon satisfactory operation of the facility. Request for renewal must be submitted at least 180 days prior to expiration of the special permit. Submitting a renewal request shall allow for continued operation of the facility until the special permit granting authority acts. At the end of that period (including extensions and renewals), the wind facility shall be removed as required by this section.

The applicant or facility owner shall maintain a phone number and identify a responsible person for the public to contact with inquiries and complaints throughout the life of the project.

4.16.10.0. Application Process & Requirements

4.16.10.1. Application Procedures

4.16.10.1.1. General The application for a wind facility shall be filed in accordance with the rules and regulations of the special permit granting authority concerning special permits.

4.16.10.1.2. Application Each application for a special permit shall be filed by the applicant with the city or town clerk pursuant to section 9 of chapter 40A of the Massachusetts General Laws.

4.16.10.2. Required Documents

4.16.10.2.1. General

The applicant shall provide the special permit granting authority with 16 copies of the application. All plans and maps shall be prepared, stamped and signed by a professional engineer licensed to practice in Massachusetts. Included in the application shall be:

4.16.10.2.2. Name, address, phone number and signature of the applicant, as well as all co- applicants or property owners, if any.

4.16.10.2.3. The name, contact information and signature of any agents representing the applicant.

4.16.10.2.4. Documentation of the legal right to use the wind facility site, including the requirements set forth in 10.3.2.(a) of this section.

4.16.10.3. Siting and Design

The applicant shall provide the special permit granting authority with a description of the property which shall include:

4.16.10.3.1. Location Map (Modify for On-Site Wind Facilities) Copy of a portion of the most recent USGS Quadrangle Map, at a scale of 1:25,000, showing the proposed facility site, including turbine sites, and the area within at least two miles from the facility. Zoning district designation for the subject parcel should be included; however a copy of a zoning map with the parcel identified is suitable.

4.16.10.3.2. Site Plan

A one inch equals 100 feet plan of the proposed wind facility site, with contour intervals of no more than 10 feet, showing the following:

- (a) Property lines for the site parcel and adjacent parcels within 300 feet.
- (b) Outline of all existing buildings, including purpose (e.g. residence, garage, etc.) on site parcel and all adjacent parcels within 500 feet. Include distances from the wind facility to each building shown.
- (c) Location of all roads, public and private on the site parcel and adjacent parcels within 300 feet, and proposed roads or driveways, either temporary or permanent.
- (d) Existing areas of tree cover, including average height of trees, on the site parcel and adjacent parcels within 300 feet.
- (e) Proposed location and design of wind facility, including all turbines, ground equipment, appurtenant structures, transmission infrastructure, access, fencing, exterior lighting, etc.
- (f) Location of priority points referenced below in 10.3.3. of this section.
- (g) Wetlands, Wildlife, Habitat and other natural features.

4.16.10.3.3. Visualizations (Modify for On-Site Wind Facilities)

The special permit granting authority shall select between three and six sight lines, including from the nearest building with a view of the wind facility, for pre- and post-construction view representations. Sites for the view representations shall be selected from populated areas or public ways within a 2-mile radius of the wind facility. View representations shall have the following characteristics:

- (a) View representations shall be in color and shall include actual pre-construction photographs and accurate post-construction simulations of the height and breadth of the wind facility (e.g. superimpositions of the wind facility onto photographs of existing views).
- (b) All view representations will include existing, or proposed, buildings or tree coverage.
- (c) Include description of the technical procedures followed in producing the visualization (distances, angles, lens, etc.).

4.16.10.4. Landscape Plan (Utility-Scale Wind Facilities Only) A plan indicating all proposed changes to the landscape of the site, including temporary or permanent roads or driveways, grading, vegetation clearing and planting, exterior lighting, other than FAA lights, screening vegetation or structures. Lighting shall be designed to minimize glare on abutting properties and except as required by the FAA be directed downward with full cut-off fixtures to reduce light pollution.

4.16.10.5. Operation & Maintenance Plan The applicant shall submit a plan for maintenance of access roads and storm water controls, as well as general procedures for operational maintenance of the wind facility.

4.16.10.6. Compliance Documents If required under previous sections of this by-law, the applicant will provide with the application:

- (a) a description of financial surety that satisfies 4.16.8.3. of this section,
- (b) proof of liability insurance that satisfies Section 4.16. 3.3. of this section,
- (c) certification of height approval from the FAA,
- (d) a statement that satisfies Section 4.16.6.3., listing existing and maximum projected noise levels from the wind facility.

4.16.10.7. Independent Consultants – (Utility-Scale Wind Facilities Only)

Upon submission of an application for a special permit, the special permit granting authority will be authorized to hire outside consultants, pursuant to section 53G of chapter 44 of the Massachusetts General Laws. As necessary, the applicant may be required to pay the consultant's costs.