

Approved at Town Meeting 2010

Wind Energy Conversion Systems

1. Amend Section 2220 Use Regulation Schedule by adding two new rows under Commercial Uses below the row “Village Mixed Use Development,” to read as follows:

DISTRICT	R-40 R-80	V-B B-1	B-2 B-4	B-3	GD
PRINCIPAL USES					
Village Mixed Use Development, subject to Section 4250	No	PB	PB	No	No
Commercial Wind Energy System (CWES) per Section 3460,	No¹⁰	No	SPR/ SP	SPR/ SP	SPR/ SP
Neighborhood Wind Energy System (NWES) per Section 3460	SPR /SP	SPR /SP	SPR /SP	No	No

Footnotes to Section 2220 Use Regulation Schedule.

10. Except “PB” in the Bournedale Overlay District, to be permitted only under provisions of Section 2700 Flexible Resource Development.

And deleting the row under Accessory Uses, below the row “Fishing-related activities” that reads “WECS Section 3460” and add a new row to read as follows:

DISTRICT	R40 R80	V-B B-1	B-2 B-4	B-3	GD
ACCESSORY USES					
Fishing –related activities	SP*	Yes	Yes	Yes	No
Residential Wind Energy System (RWES) per Section 3460	SPR/SP	SPR/SP	SPR/SP	No	No

2. Amend Section V Definitions so that the definition of “Building Height” reads as follows:

“Building Height

“The vertical distance between the highest point of the building or other structure and the average of the elevation of the land that adjoins the building or other structure on all sides, 12’ from the building, with that elevation to be based upon the land in its natural state prior to construction, grading or filling, not finished grade. Height limitations shall not apply to chimneys, spires, cupolas, wind energy conversion systems and TV antennas, except as specified in footnote ‘n’ to Section 2500 Intensity of Use Schedule. Building height shall be determined separately for separate portions of buildings where that separation is articulated by related breaks of three feet or more in both roof and wall planes.”

3. Delete Section 3460 Wind Energy Conversion Systems (WECS) in its entirety and replace it with the following.

3460. WIND ENERGY CONVERSION SYSTEMS (WECS).

3461. Purpose.

The purpose of this section is to provide for the development and use of wind power as an alternative energy source, benefiting both the economy and the environment, while protecting public health, safety and welfare, preserving environmental, historic and scenic resources, controlling noise levels and preventing electromagnetic interference.

3462. Applicability.

Any application to erect a wind energy conversion system shall comply with section 3460, with the following exemptions.

- A. WECS having manufacturer’s rated capacity of not more than 300 watts, or.
- B. Building-mounted WECS having overall height not more than eight feet (8’) above the roof’s highest point.

3463. Definitions.

A. Wind Energy Conversion Systems (WECS)

All equipment, machinery and structures utilized in the connection with the conversion of wind to other forms of energy.

B. Commercial Wind Energy System (CWES)

A WECS consisting of one or more wind turbines with a rated capacity greater than 10 kW.

C. Residential Wind Energy System (RWES)

A WECS consisting of a single wind turbine, with a rated capacity of not more than 10 kW, intended as an accessory use

D. Neighborhood Wind Energy System (NWES)

A Class I, II, or III net metering wind turbine located in a residential district serving multiple residential customers served by a single utility and as further defined by the Massachusetts Department of Public Utilities (DPU).

E. Wind Turbine

A single device that converts wind to electricity or other forms of energy, typically consisting of a rotor and blade assembly, electrical generator, and tower with or without guy wires.

F. Basic fall zone

The area that lies within a distance equal to the total height of the wind turbine (including blade assembly) plus 10 feet from the base of the wind turbine tower.

G. Engineer designed fall zone

An area less than the basic fall zone, as designed and certified by a Massachusetts professional licensed structural engineer for a wind turbine. that has been designed to fall , if at all, in a manner that precludes any significant risk of causing harm beyond the designed zone, subject to peer review at the expense of the applicant if required by the Planning Board.

H. Critical Infrastructure

Facilities and infrastructure listed within the Town of Bourne's Pre-Disaster Hazard Mitigation Plan.

3464. Special Permit Granting Authority

The Planning Board shall grant a Special Permit only if it finds that the proposal complies with the provisions of this Bylaw (including allowed waivers and imposed conditions), taking into consideration among other things the height of

the WECS in relation to the anticipated amount of electrical energy generation, the location of the WECS in relation to topography, the natural environment, dwellings, historical and scenic features, and safety.

3465. Development Requirements.

A. Required of all WECS

1. Proposed WECS shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable electrical, construction, noise, safety, environmental and communications requirements.
2. Applicants shall provide a complete description of the proposed WECS including technical, economic, environmental, and other reasons for the proposed location, height and design.
3. Height Calculation. Overall height of the WECS shall be measured from the land in its natural state at the base of the tower prior to grading or filling to the highest point reached at any time by any part of the wind turbine. For WECS attached to a building, height is to be measured as specified in footnote “n” to the Section 2500 Intensity of Use Schedule, and the provisions of that footnote must be complied with.
4. Flight Path Height Restriction. No WECS located in the flight path as shown on a map entitled “ USCG Air Station Cape Cod Emergency Visual Routes in Inclement Weather” Bourne, Massachusetts, dated January 26, 2007 which is attached hereto and made part hereof, shall be erected or altered to a height, which would exceed one hundred (100) feet. WECS erected between 60 to 100 feet within the USCG flight path shall include a fixed warning light. *(See Figure C)*
5. Monopole towers are the preferred type of support.
6. Setbacks. *(See illustrative figures A and B)*
 - a) WECS shall observe a setback distance from all property lines equal to the Basic Fall Zone or, if adequately documented as determined by the Planning Board, the Engineer Designed Fall Zone , provided

that the project satisfies all other criteria for the granting of a special permit under the provisions of this section.

- b) No part of the WECS support structure, including guy wire anchors, may extend closer to the property boundaries than the standard structure setbacks for the zone where the land is located.
 - c) WECS shall be set back a distance equal to the basic fall zone from critical infrastructure or public ways. The Planning Board may waive this requirement based on its determination that site-specific considerations assure adequate public safety.
 - d) In acting on a special permit, the Planning Board may reduce setback distances for the WECS provided that:
 - 1) An easement agreement from any affected abutting property owner is received, and is recorded along with an easement plan depicting such agreement, or
 - 2) The affected property adjacent to the WECS site is permanently protected in perpetuity and recorded as such in a deed, conservation restriction or other official document and enforceable by the Town. The restriction shall assure that such land shall be kept in an open or natural state and not be built upon or developed.
7. Wetlands. No part of a WECS shall be located within the jurisdiction of the Bourne Conservation Commission unless issued an Order of Conditions.
8. Noise. The WECS and associated equipment shall conform to the Massachusetts noise regulation (310 CMR 7.10). An analysis, prepared by a qualified engineer, shall be presented to demonstrate compliance with these noise standards and be consistent with Massachusetts Department of Environmental Protection guidance for noise measurement.

- a) Manufacturers' specifications may be accepted when in the opinion of the Planning Board the information provided satisfies the above requirements.
 - b) Upon written notification of a complaint of excessive noise, the Inspector of Buildings/Chief Zoning Enforcement Officer or his designee, herein after referred to, as the Enforcing Person, shall record the filing of such complaint. The Enforcing Person shall promptly investigate. If noise levels are determined to be excessive, the Enforcing Person shall require the property owner to perform ambient and operating decibel measurements at the nearest point from the wind turbine to the property line of the complainant and to the nearest inhabited residence.
 - c) If the noise levels are found to have exceeded allowable limits the Enforcing Person shall notify in writing the owner of the property to correct the violation. If the noise violation is not remedied within 30 days the WECS shall remain inactive until the noise violation is remedied, which may include relocation or removal.
 - d) If determined that allowable limits have not been exceeded, notice in writing shall be provided to the person who has filed such complaint and the owner of the property stating that no further action is required, all within fourteen (14) days of the receipt of the request. Any person aggrieved by the decision may appeal said decision to the Board of Appeals in accordance with Section 1320 of this Bylaw. Any such appeal must be filed within (30) days after the receipt of the decision of the Chief Zoning Enforcement Officer or Enforcement Officer.
9. **Shadowing/Flicker.** The WECS shall be sited in a manner that does not result in significant 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 either through siting or mitigation.

10. **Prevention of Access.** The applicant/owner shall ensure that all related components of the WECS are protected from unlawful access.

11. **Visual Impact.** The applicant shall employ all reasonable means, including restraint in tree removal, landscaping, and alternative locations to minimize the visual impact of all WECS components. All components of the WECS and its support structure shall be painted plain non-reflective muted colors.

No WECS shall exhibit any form of decoration or graphics unless given express approval by the Planning Board, and then shall be limited to the name of occupant of the premises or manufacturer located on the nacelle of the wind turbine.

~~11.~~12. **Electromagnetic interference.** No WECS installation shall cause electromagnetic interference. If interference is established the Inspector of Buildings shall notify the owner of the property in writing to correct the violation. If the interference is not remedied within 30 days the WECS shall remain inactive until the interference is remedied, which may include relocation or removal.

~~12.~~13. **Lighting.** If lighting is proposed (other than required FAA lights) the applicant shall submit a plan indicating the horizontal foot candles at grade, within the property line and for twenty-five (25) feet beyond the property lines. The plan shall also indicate the locations and types of luminaries proposed.

~~13.~~14. **Vegetation.** Existing vegetation must be shown including average height of trees and any proposed vegetation removal on the subject property or abutting properties. The Planning Board shall also consider the height of vegetation at maturity.

~~14.~~15. **Compliance with FAA Regulations and MMR Flight Paths.** WECS must comply with applicable FAA regulations and MMR flight paths as shown on the map referred to in Section 3465(4).

~~15.~~16. **Avian impact avoidance.** Applicants for a special permit for a CWES shall submit to the Planning Board documentation that the siting, equipment selection, facility design, and operation management will

effectively minimize avian impacts, evidenced by an avian impact assessment conducted by a qualified third party, assessing the potential impact of the proposed WECS upon bird and bat species. The avian study shall at a minimum report on a literature survey for threatened and endangered species, and any information on critical flyways. The applicant must identify any plans for post-construction monitoring or studies. The analysis shall also include an explanation of potential impacts and propose a mitigation plan, if necessary.

B. Residential Wind Energy Systems (RWES).

1. Shall consist of a single wind turbine per lot, with a rated capacity less than 10 kW.
2. The overall height shall be determined by special permit. Overall height must be consistent meeting the setback requirements of Section 3465 A.6 and, if more restrictive, shall not exceed seventy-five (75) feet in overall height unless as part of the special permit process the applicant demonstrates that additional height is functionally essential and that the additional height does not does not substantially increase any adverse impacts.

C. Neighborhood Wind Energy System (NWES)

1. Shall consist of a single Class I, II, or III net metering wind turbine as defined by the Massachusetts Department of Public Utilities, with a rated output greater than 10kW, located in a residential district.
2. Shall be owned by or serve the energy needs of multiple residential customers, served by a single utility in a single neighborhood.
3. Shall be subject to the requirements of the CWES specified in Section 3465 D.

D. Commercial Wind Energy Systems (CWES).

1. A Wind Turbine with a rated capacity of more than 10 kW
2. May include multiple wind turbines, however, in no event, shall the number of wind turbines exceed one (1) per two (2) acres,

3. Land area may be comprised of several contiguous parcels single or multiple ownership.
4. A wind turbine erected on a lot with another principle use requires a lot area twice the minimum lot area as stated in Section 2500.
5. Height shall be determined by special permit. The Planning Board shall make findings that the height proposed reflects industry standards for a similarly-sited facility, and is necessary for adequate operation of the CWES.
- ~~5.6.~~ Projects including land in multiple ownerships shall include each owner of the land as a party to the application and, upon plan approval, subject to its provisions.
- ~~6.7.~~ Telecommunications. CWES may include telecommunication antennas provided they comply with Section 2500 of this bylaw. The telecommunications carrier shall be named as the co-applicant. Co-applications are encouraged.

3466. Procedural Requirements:

A. Special permit submittals

1. **Site Plan.** A site plan must be submitted, prepared to scale by a registered land surveyor or civil engineer showing the location of the proposed WECS, distances to all property lines, existing and proposed structures, existing and proposed elevations, public and private roads, above ground utility lines and any other significant features or appurtenances. Any portion of this section may be waived if in the opinion of the Planning Board the materials submitted are sufficient for the Board to make a decision.
2. **Inspection.** Provisions for inspection and maintenance must be made and identified in the submittals.

B. Building permit submittals

1. **Wind Turbine structure drawings.** Building permit applications shall be accompanied by standard drawings of the wind turbine structure, including the tower, base, and footings. Documentation showing

compliance with the Massachusetts State Building Code certified by a licensed professional engineer shall also be submitted. (Manufacturer specifications may be suitable at the discretion of the Inspector of Building)

2. **Electrical drawings.** Building permit applications for WECS shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code.
3. **Utility Notification.** No WECS shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.
4. **Insurance.** The applicant shall be required to show evidence of liability insurance in an amount and for duration sufficient to cover loss or damage to persons and structures occasioned by the failure or performance of the facility.

C. Abandonment A WECS shall be considered to be abandoned if it is not operated for a period of two years or if it is designated a safety hazard by the Inspector of Buildings. Once a WECS is designated as abandoned, the owner shall be required to physically remove the WECS within 90 days of written notice. "Physically remove" shall include, but not be limited to:

1. Removal of WECS, any equipment shelters, and security barriers from the subject property.
2. Removal of foundation, unless in the opinion of the Inspector of Buildings the foundation will pose no hazard.
3. Proper disposal of the waste materials from the site in accordance with local and state solid waste disposal regulations.
4. Restoring the location of the WECS to its natural condition, except that any landscaping and grading shall remain in the after-condition.

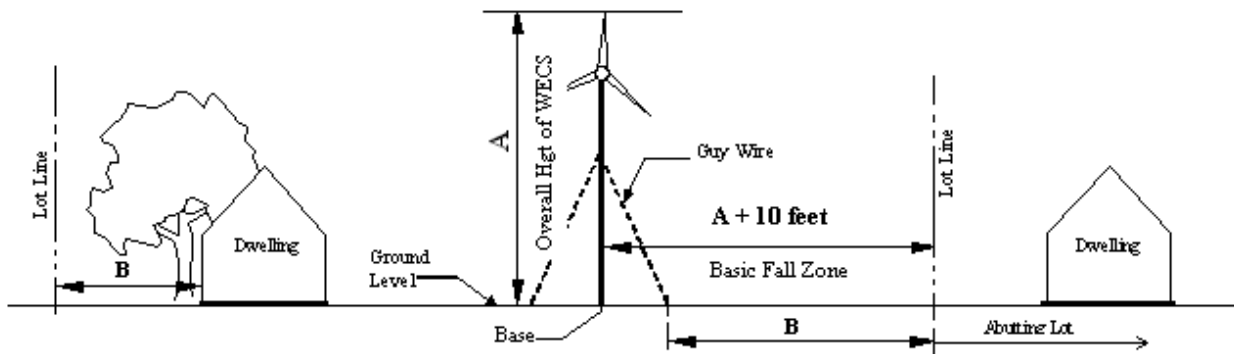
D. Modifications. All modifications to a WECS made after issuance of the Special Permit shall require approval by the Planning Board.

E. Professional Fees. The Planning Board may retain a technical expert/consultant to verify information presented by the applicant. The cost for such a technical expert/consultant will be the expense of the applicant.

3467. Security.

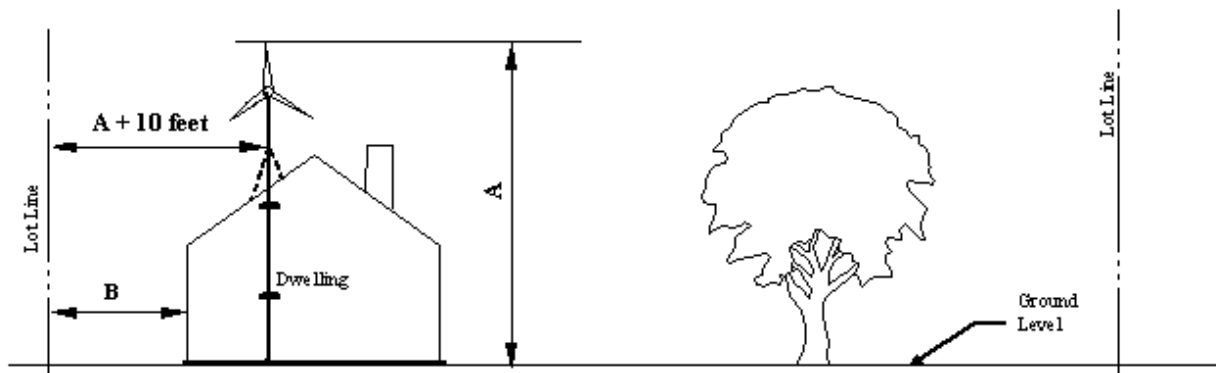
- A. Requirement.** In conjunction with the above special permit approval process the Planning Board may require the posting of a bond or other security to assure satisfactory fulfillment of the above, in such sum and in accordance with such conditions as the Board may determine necessary.
- B. Exception.** The Board need not require security where there is full assurance of compliance with the above special permit
- C. Amount.** The amount of security required shall not exceed either the estimated costs of the measures proposed, or the estimated cost of restoration of affected lands and property if the work is not performed as required, whichever is the greater.

Figure A & B



A = Overall height of WECS
B = Standard structure setback

**Free standing WECS
(Figure A)**



**Building Mounted WECS
(Figure B)**