

**Amendment to Rehoboth By-law:
Use of Wind Energy Facilities
To be added as Section 4.9 Under Article 4 of the Existing Zoning By-laws
Draft 8 date July 16, 2009**

1.0 Purpose:

The purpose of this by-law is to provide for the construction and operation of wind energy 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.

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

1.1 Applicability

- (a) This Wind Energy Facilities section applies to each of the following after the effective date of this Wind Energy Facilities section
 - i. Every utility-scale wind energy facility,
 - ii. Every on-site wind energy facility,
 - iii. Every small wind energy system
 - iv. Every residential micro wind energy system; and
 - v. Every building integrated wind energy facility
- (b) This Wind Energy Facilities Section applies to each facility or system described in (a) i to v above which is constructed before the effective date of this Wind Energy Facilities Section if such facility or system is to be physically modified after the effective date of this Wind Energy Facilities Section in a manner that materially alters the type, configuration or size of such facility, system, or related equipment.
- (c) This Wind Energies Facilities Section does not apply to off-shore Wind Energy Facilities.

2.0 Definitions

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

On-Site Wind Energy Facility: A wind project, which is located at a commercial, industrial, agricultural, institutional, or public facility that will generate electricity to be used primarily on-site.

Residential Micro-wind Energy System: A wind generating system capable of providing power needs for an individual home and outbuildings with an elevated height of no more than 100 feet.

Height: The height of a:

- (a) Horizontal axis wind turbine measured from natural grade to the tip of the rotor blade at its highest point, or blade-tip height.
- (b) Vertical axis wind turbine measured from natural grade to the tip of the vertical turbine shaft upon which the vertical blades rotate or the rotor blade whichever is higher.

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.

Special Permit Granting Authority: The special permit granting authority shall be the Planning Board.

Zoning Board of Appeals: Appeal authority for disagreements on special permit decisions made by the Planning Board

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

Wind Energy 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.

Wind Monitoring or Meteorological Tower: Temporary towers used to gather wind data necessary for site evaluation and development of wind energy projects. In addition the MET tower can be equipped to record temperature, solar radiation and air pressure if necessary, but are not used for the purpose of generating electricity.

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 for a horizontal turbine or genset for a vertical turbine, and a rotor with two or more blades.

Building Inspector: The inspector of building or the zoning enforcement officer charged with the enforcement of the zoning ordinance. The building inspector is the permit granting authority for building permits.

Building Permit: A building permit is a required approval of a project by the building inspector which is consistent with the state building codes. In addition, the permit must meet the criteria set forth under the local zoning by-laws regarding small and residential micro-wind energy systems.

Special Use Permit: A permit provided by the special permit granting authority for installation of wind energy facilities or MET towers by business and industrial entities and for large wind /Utility scale facilities.

Micro Wind Energy System: All equipment, machinery and structures utilized in the connection with the conversion of kinetic energy of wind into electrical power. This includes, but is not limited to, storage, electrical collection and supply equipment, transformers, service and access paths. Small wind energy facility system may be comprised of one or more wind turbines with a total rated nameplate capacity of not more than 50 kW/.05MW.

Small Wind Energy System: All equipment, machinery and structures utilized in connection with the conversion of kinetic energy of wind into electrical power. This includes, but is not limited to, storage, electrical collection and supply equipment, transformers, service and access roads. Small wind energy facility system may be comprised of one or more wind turbines with a total rated nameplate capacity of not more than 100kW/ 0.1MW.

Large Wind Energy Facility: All equipment, machinery and structures utilized in connection with the conversion of kinetic energy of wind into electrical power. This includes, but is not limited to, storage, electrical collection and supply equipment, transformers, service and access roads. Large wind energy facility system may be comprised of one or more wind turbines with a total rated nameplate capacity of greater than 100kW/ 0.1MW.

Agriculture: ‘Farming’ or ‘agriculture’ shall include farming in all of its branches and the cultivation and tillage of the soil, dairying, the production, cultivation, growing and harvesting of any agricultural, aquacultural, floricultural or horticultural commodities, the growing and harvesting of forest products upon forest land, the raising of livestock including horses, the keeping of horses as a commercial enterprise, the keeping and raising of poultry, swine, cattle and other domesticated animals used for food purposes, bees, fur-bearing animals, and any forestry or lumbering operations, performed by a farmer, who is hereby defined as one engaged in agriculture or farming as herein defined, or on a farm as an incident to or in conjunction with such farming operations, including preparations for market, delivery to storage or to market or to carriers for transportation to market.

Building Integrated Wind Energy Facility: A wind energy facility shall be considered to be building integrated if it is designed to be permanently mounted on a building or other inhabitable structure. This definition applies to wind turbines of any capacity that are designed to be operated in direct contact with a building. This definition also covers, for the purposes of this zoning provision, other wind energy facilities primarily used for land-based applications which may be permanently mounted and operated on a building.

3.0 General Requirements for all Wind Energy Facilities

The following requirements are common to all wind energy facilities and must be followed in addition to the technology-specific requirements given in sections 4, 5, or 6.

3.1 Required Permits

A permit shall only be granted if the permit granting authority determines that the intent of this bylaw is followed as each of its specific criteria are fully met. The wind energy Technology types listed below determine the number and types of permits needed to implement wind energy facilities:

<u>Technology</u>	<u>Permit Needed</u>
Residential Micro Wind Energy System	Building Permit
Small Wind Energy Systems or MET towers	Building Permit *
Large Wind-Utility scale or on-site wind Energy Facilities	Special Permit and Building Permit
Building Integrated Wind Energy System	Special Permit and Building Permit

*Business/industrial entities as defined in town Zoning By-laws Article 4.2 and 4.3 utilizing wind generation facilities of any size must obtain a special permit.

3.2 Additional Conditions for Granting of Special Permits

No special permit shall be granted for a use which is, in the opinion of the Special Permit Granting Authority, injurious, noxious, offensive, detrimental or inappropriate to adjacent properties or to the neighborhood or for a use which does not substantially serve public health, safety, convenience, welfare or property values in the neighborhood.

3.3 Compliance with Laws, Ordinances and Regulations

The construction and operation of all such proposed wind energy 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.

3.4 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 property occasioned by the failure of the facility.

3.5 Site Control

At the time of its application for a special or building 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. Control shall mean the legal authority to prevent the use or construction of any structure for human habitation within the setback areas.

3.6 Utility Notification

No wind energy facility 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.

3.7 Temporary Meteorological Towers (MET Towers)

Met towers shall be permitted under the same standards as a small wind system, except that the requirements apply to a temporary structure. A permit for a temporary met tower shall be valid for a maximum of 1 year after which an extension may be granted. Small anemometers installed directly on buildings shall not require a building or special permit.

3.8 Design Standards

3.8.1 Appearance, Color and Finish

FAA safety consideration on color and appearance should be respected. Where applicant is seeking a non-standard color in an area not regulated by the FAA, the appropriate permit granting authority has authority to regulate color of turbine and supporting tower.

3.8.2 Exterior Lighting

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

3.8.3 Signage

Signs on the wind energy 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 wind energy facility and the benefits of renewable energy.

3.8.4 Advertising

Wind energy facilities shall not be used for displaying any advertising except for identification of the manufacturer or operator of the wind energy facility in conformance with section 3.7.3.

3.8.5 Utility Connections

Reasonable efforts shall be made to locate utility connections from the wind energy 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.

3.8.6 Accessory Structures

All accessory structures to such wind energy facilities shall be subject to existing zoning regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements. All such accessory structures, including but not limited to, equipment shelters, storage facilities, transformers, substations shall be architecturally compatible with each other and shall be contained within the turbine tower(s) or if separate, landscaped and screened from view by vegetation, located underground, or behind berms, and/or clustered to minimize visual impacts.

3.9 Safety and Environmental Standards

3.9.1 Emergency Services

The applicant shall provide a copy of the project summary, electrical schematic, and site plan to the fire department and inspector of buildings, as designated by the permit granting authority. Upon request the applicant shall cooperate with local emergency services in developing an emergency response plan. All means of disconnecting the wind energy facility shall be clearly marked. 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.

3.9.2 Unauthorized Access

Wind turbines or other structures part of a wind energy facility shall be designed to prevent unauthorized access. For instance, towers shall be designed and installed so as to not provide step bolts or other climbing means readily accessible to the public for a minimum height of 8 feet above the ground. Electrical equipment access shall be restricted to authorized personnel only.

3.9.3 Shadow/Flicker

Wind energy 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.

3.9.4 Noise

The wind energy facility and associated equipment shall conform with the provisions of the Rehoboth Zoning Bylaw Section 6.6 “Standards” Subsection 3 “Measurement at Lot Line” (b) “Noise”.

3.9.5 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.

3.10 Monitoring and Maintenance

3.10.1 Facility Conditions

The applicant/owner/operator shall maintain the wind energy 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 Fire Chief and Building Inspector. The project owner shall be responsible for the cost of maintaining the wind energy facility and any access road(s), unless accepted as a public way, and the cost of repairing any damage occurring as a result of operation and construction.

3.10.2 Modifications

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

3.11 Abandonment or Decommissioning

3.11.1 Removal Requirements

Any wind energy facility or meteorological (MET) tower which has reached the end of its useful life or has been abandoned shall be removed. When the wind energy facility or MET is scheduled to be decommissioned, the applicant/owner/operator 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 energy facility no more than 150 days after the date of discontinued operations. At the time of removal, the wind energy facility site shall be restored to the state it was in before the facility was constructed or any other legally authorized 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 permit granting authority may allow the owner to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

3.11.2 Abandonment

Absent notice of a proposed date of decommissioning, the facility or meteorological tower shall be considered abandoned when the wind energy facility fails to operate for more than one year without the written consent of the permit granting authority. The permit granting authority shall determine in its decision what proportion of the wind energy facility is inoperable for the wind energy facility to be considered abandoned. If the applicant fails to remove the wind energy 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 wind energy facility at the applicant/owner/operator's expense.

3.11.3 Expiration

A wind energy facility special permit issued pursuant to this ordinance shall expire if:

- (a) The wind energy facility is not installed and functioning within 48-months from the date the permit is issued; or,
- (b) The wind energy facility is abandoned.

Extensions may be granted for cause by the permit granting authority.

3.11.4 Violations

It is unlawful for any person to construct, install, or operate a wind energy system that is not in compliance with this bylaw or with any condition contained in a permit issued pursuant to this bylaw. Penalties for violation under this bylaw shall be as described in Article 7.1 "Enforcement" of the Rehoboth Zoning Bylaw. Wind energy systems installed prior to the adoption of this ordinance are exempt.

3.11.5 Exemption

Residential Micro Wind Energy Systems are exempt from all requirements in section 3.10.1, 3.10.2 and 3.10.3.

3.12 Support Towers

Monopole towers shall be used as the support structure for Wind Turbines; this requirement may be waived by the permit granting authority for good cause shown by the application as determined in the discretion of the permit granting authority.

4.0 Micro Wind and Small Wind Energy Facility Requirements

4.1 Building Permit

No micro wind or small wind energy system shall be erected, constructed, installed or modified as provided in this section without first obtaining a building permit from the building inspector. All such wind energy systems shall be constructed and operated in a manner that minimizes adverse visual, safety and environmental impacts. The construction of a micro wind or small wind energy facility shall be permitted in any zoning district subject to the issuance of a Permit and provided that the use complies with all requirements set forth in sections 3 and 4.

4.2 Height

Micro wind energy systems shall be no greater than 100 feet above the current grade. Small wind energy systems shall be not greater than 250 feet above the current grade of the land for small wind systems.

4.3 Setbacks

Micro and small wind turbines shall be set back a distance greater than or equal to the total height of the wind turbine from the nearest property line and public way.

4.4 Application Process & Requirements

A building permit shall be required for the installation of either micro or a small wind energy system.

4.4.1 General Required Documents

The building permit application shall be accompanied by deliverables including the following:

- (a) A site plan showing:
 - i. Property lines and physical dimensions of the subject property within 2 times the total height of the wind turbine from the proposed tower location.
 - ii. Location, dimensions, and types of existing major structures on the property
 - iii. Location of the proposed wind energy system tower, foundations, guy anchors and
 - iv. Associated equipment.
 - v. The right-of-way of any public road that is contiguous with the property;
 - vi. Any overhead utility lines
 - vii. Location and approximate height of tree cover;
- (b) Wind energy system specifications, including manufacturer and model, rotor diameter, tower height, tower type (freestanding or guyed)
- (c) One or three line electrical diagram detailing wind turbine, associated components, and electrical interconnection methods, with all NEC compliant disconnects and over current devices.
- (d) Foundations for towers must have blueprints or drawings signed by a Professional Engineer Licensed in the Commonwealth of Massachusetts.

- (e) Support towers of any height that are anchored to or mounted on a building must have blue prints with certification signed by a professional engineer that the anchoring building structure is sufficient to withstand the structural loading of the wind turbine equipment and stresses caused by the vibration resulting from rotor rotations at maximum wind speed for the area.
- (f) Name, address, phone number and signature of the applicant, as well as all co-applicants or property owners, if any.
- (g) The name, contact information and signature of any agents representing the applicant.
- (h) A plan for maintenance of the small wind energy facility.
- (i) Business and industrial entities must provide an additional eight (8) copies of the required site plan to the Special Permit Granting Authority. At the discretion of the building inspector, a site plan approval application may be required.

5.0 Large Wind Energy Facility Requirements (Utility and On-Site Projects)

Special permits shall be granted by the Permit Granting Authority for large wind energy facilities that meet the criteria outlined in this section and in section 3 of this zoning provision.

5.1 Special Permit Granting Authority

No wind energy facility over 100 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 energy facility shall be permitted subject to the issuance of a Special Permit and provided that the use complies with all requirements set forth in sections 3 and 5. All such wind energy facilities shall be constructed and operated in a manner that minimizes adverse visual, safety, and environmental impacts.

5.2 Financial Surety

The permit granting authority shall require the applicant for utility scale wind energy facilities to provide a form of surety, 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.

5.3 Height

Large wind energy facilities shall be no higher than 450 feet above the current grade of the land

5.4 Setbacks

Large wind turbines shall be set back a distance greater than or equal to the 1.2 times the total height of the wind turbine from the nearest property line and public way.

5.5 Required Supporting Documentation

The applicant shall provide the special permit granting authority with 20 copies of a description of the proposed project which shall include:

5.5.1 General

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:

- (a) Name, address, phone number and signature of the applicant, as well as all co-applicants or property owners, if any.
- (b) The name, contact information and signature of any agents representing the applicant.
- (c) Documentation of the legal right to use the wind facility site.

5.5.2 Technical Documentation

The applicant shall, at a minimum, submit the following technical documentation regarding the proposed wind energy facility to the special permit granting authority.

- (a) Wind energy facility technical specifications, including manufacturer and model, rotor diameter, tower height/type, foundation type/dimensions
- (b) Tower foundation blueprints or drawings signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.
- (c) Tower blueprints or drawings signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.
- (d) Electrical schematic

5.5.3 Location Map: Utility Scale Projects

The applicant shall submit, to the permit granting authority, a 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 by map number and plot number for the subject parcel should be included; however a copy of a zoning plot plan with the parcel identified is suitable.

5.5.4 Site Plan

A one inch equals 40 feet plan of the proposed wind facility site, with contour intervals of no more than 2 feet, showing the following:

- (a) Property lines for the site parcel prepared by a Professional Land Surveyor.
- (b) Outline of all existing buildings, including purpose (e.g. residence, garage, etc.) on site parcel.
- (c) Location of all roads, public and private on the site parcel and adjacent parcels if within the setback distance of 1.2 times the blade tip height, 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 if within the setback distance of 1.2 times the blade tip height.
- (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 viewpoints referenced below in 5.6.4 of this section.

5.5.5 Visualizations

The special permit granting authority may select up to four sightlines, 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 proposed wind energy 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 energy facility (e.g. superimpositions of the wind facility onto photographs of existing views or a balloon height simulation test).
- (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.).

5.5.6 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.

5.5.7 Compliance Documents

The applicant will provide with the application:

- (a) description of financial surety that satisfies 5.2 of this section,
- (b) proof of liability insurance that satisfies Section 3.4 of this section,
- (c) certification of approval from the FAA,
- (d) a statement that satisfies Section 3.8.4, listing existing and maximum projected sound levels from the wind energy facility.

5.5.8 Landscape Plan: (Utility Scale Wind Facility Projects 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. Landscaping proposals shall meet the requirements of Section 6.7 Site Plan Approval subsection 6. Site Plan Review Criteria paragraph "b" of the Rehoboth Zoning Bylaw. 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.

5.6 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. The applicant will be required to pay 100% of the consultant's costs.

5.7 Large Wind Energy Facility Requirements (Utility and On-Site Projects)

Special Permit Fee shall be established by the Special Permit Granting Authority.

6.0 Building Integrated Wind Energy Facilities

Special permits shall be granted by the Permit Granting Authority for building integrated wind energy facilities that meet the criteria outlined in this section and in section 3 of this bylaw.

6.1 Special Permit Granting Authority

No building integrated wind energy facility 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 building integrated wind energy facility shall be permitted subject to the issuance of a Special Permit and provided that the use complies with all requirements set forth in sections 3 and 6. All such wind energy facilities shall, where economically feasible, be constructed and operated in a manner that minimizes any adverse visual, safety, and environmental impacts.

6.2 Required Supporting Documentation for Building Integrated Wind Energy Facilities

The special permit application submitted to the Permit Granting Authority must, at a minimum, include:

- (a) Analysis and design documents, completed by a structural engineer registered to practice in the Commonwealth of Massachusetts, demonstrating that the proposed building is structurally sufficient to support the permanent installation of the proposed building integrated wind energy facility. At a minimum, the analysis should address vibration, wind load, and ice load.
- (b) Elevation drawings of building with building integrated wind energy facility installed, viewed from north, south, east, and west.
- (c) Building schematic detailing point(s) of connection and associated supports for the building integrated wind energy facility.
- (d) Schematic of attachment method for connecting the building integrated wind energy facility to the building.
- (e) Specification sheets for wind turbine and all related components (inverters, controllers, disconnects, etc.)
- (f) One or three line electrical diagram detailing wind turbine, associated components, and electrical interconnection methods, with all NEC compliant disconnect and over current devices.