

Section 10.33. **Wind Energy Conversion Systems**

Source: Ord. 650-2nd Series
Effective Date: 12/14/09

Subd. 1. **Intent and Purpose.** The purpose of this Section is to establish standards and procedures by which the installation and operation of commercial and non-commercial wind energy conversion systems (WECS) shall be governed within the City of Alexandria while protecting the public health, safety and general welfare of the community.

Subd. 2. **Application.**

- A. These regulations apply to the location, size, use, design construction, operation, maintenance, appearance and removal of all WECS, windmills, wind turbines, wind generators, wind chargers or similar devices.
- B. Ornamental wind devices, not used for energy conversion, that are less than 24 feet in height and less than 120 square feet in horizontal area, are exempt from this Section. All other applicable regulations in City Code apply.

Subd. 3. **Definitions.**

- A. Commercial Wind Energy Conversion System (WECS): A WECS of equal to or greater than 40kW in total nameplate generating capacity.
- B. Feeder Line: A power line that carries electrical power from one or more wind turbines or individual transformers associated with individual wind turbines to the point of interconnection with the electrical power grid, in the case of interconnection with the high voltage transmission systems the point of interconnection shall be the substation servicing the WECS.
- C. Meteorological Tower: Towers erected to measure wind speed and direction plus other data relevant to siting WECS. Meteorological towers shall be regulated as commercial towers under Section 10.31 (Wireless Telecommunication Towers and Antennas), as may be amended.

- D. Non-commercial WECS: A WECS of less than 40kW in total name plate generating capacity.
- E. Rotor Diameter: The diameter of the circle described by the moving rotor blades.
- F. WECS Tower: A vertical structure that supports an electrical generator, rotor blades, and/or meteorological equipment used in the operation of a WECS.
- G. WECS Total Height: The highest point above ground reached by a rotor tip or any other part of the WECS.
- H. WECS Tower Height: The total height of the WECS exclusive of the rotor blades.
- I. Wind Energy Conversion System (WECS): An electrical generating facility comprised of one or more wind turbines and accessory facilities, including but not limited to: power lines, transformers, substations, and metrological towers, that operate by converting the kinetic energy of wind into electrical energy. The energy may be used on-site or distributed to the electrical grid.
- J. Wind Turbine: Any piece of electrical generating equipment that converts the kinetic energy of blowing wind into electrical energy through the use of airfoils or similar devices to capture the wind.

Subd. 4. **Conditional Use Permit Required.**

- A. The erection of a WECS, both commercial and non-commercial, shall require a conditional use permit, as prescribed by Section 10.23 of City Code and the additional provisions and standards as set forth in this Section.

Subd. 5. **Location by District.** A WECS may be allowed by conditional use permit as follows:

- A. Non-commercial WECS shall be allowed as conditional uses within the R-1, R1-A, R-2, R-3, R-4, R-B, R-V/A, R-LD, B-1, B-2, I-2, I-B Zoning Districts and Residential or

Mixed-Use Planned Unit Developments.

B. Commercial WECS shall be allowed as conditional uses within the R-V/A, R-LD, B-1, B-2, I-1, I-2, I-B Zoning Districts and in Non-Residential Planned Unit Developments.

Subd. 6. **Application Requirements.** All applications for a WECS conditional use permit shall be accompanied by a site plan drawn to scale and dimensioned displaying following:

1. The names of project applicants and property owners.
2. Project address and legal description.
3. A description of the project including; type, name plate generating capacity, tower height, rotor diameter, and total height of all wind turbines and means of interconnecting with the feeder lines.
4. Site layout, including the location of property lines, wind turbines, electrical grid, and all related accessory structures. This site layout shall include distances and be drawn to scale.
5. Certification by an Engineer competent in disciplines of WECS of structure design, electrical design, and fall zone.
6. Location and height of all existing and proposed buildings, structures, above ground utilities, and trees on the lot, including both existing and proposed structures and guy wire anchors.
7. Location and height of all adjacent buildings, structures, aboveground utilities and trees located within three hundred fifty (350) feet of the exterior boundaries of the property in question.

8. Location of wetlands, scenic, and natural areas within 1,320 feet (1/4 mile) of the proposed WECS(s).
9. An elevation drawing of the premises accurately depicting the proposed WECS and its relationship to structures on the subject site and adjacent lots.
10. A written statement or map describing how the proposed structure relates to existing arrival/departure corridors utilized by air ambulances.
11. An Acoustical Analysis that certifies that the noise requirements as prescribed by the Minnesota Pollution Control Agency can be met.
12. An FAA permit, if required.
13. Location of and evidence that there will be no interference with any commercial and/or public safety communication towers within two miles of the proposed WECS.
14. A Decommissioning Plan: Each Commercial/Utility WECS shall have a Decommissioning plan outlining the anticipated means and cost of removing WECS at the end of their serviceable life or upon being discontinued. The cost estimates shall be made by a competent party, such as a Professional Engineer, a contractor capable of decommissioning or a person with suitable expertise or experience with decommissioning. The plan shall also identify the financial resources that will be available to pay for decommissioning and removal of the WECS and accessory facilities.

Subd. 7. **Performance Standards.**

- A. No more than one WECS tower shall be permitted per parcel.

B. A WECS shall not interfere with hospital heliport approach/departure corridors as defined by the Minnesota Department of Transportation.

C. Setbacks.

1. No part of a WECS (including guy wire anchors) shall be located within or above any required front, side, or rear yard setback.

2. WECS towers shall be setback from all property lines a total of 110% of the WECS total height.

D. Height. The permitted maximum height of a WECS shall be determined in one of two ways. In determining the height of the WECS, the total height of the system shall be included. System height shall be measured from the base of the tower to the highest possible extension of the rotor. The height of a WECS must also comply with Federal Aviation Administration and Airport Zoning Clear Zone Regulations.

1. A ratio of one (1) foot to one (1) foot between the distance of the closest property line to the base of the WECS to the height of the system.

2. A maximum system height of one hundred seventy-five (175) feet.

3. The shortest height of the two (2) above-mentioned methods shall be used in determining the maximum allowable height of a WECS system.

E. A WCES shall be designed with a monopole with or without guy wires. Lattice towers are prohibited.

F. Blade arcs created by the WECS shall have a minimum of thirty (30) feet of clearance over any structure or tree.

G. A WECS shall be equipped with both a manual and automatic braking device capable of stopping the WECS operation in high winds (40 miles per hour or greater).

- H. A WECS shall be grounded to protect against natural lightning strikes in conformance with the Electrical Code as adopted by the City.
- I. To prevent unauthorized climbing, WECS towers must comply with one of the following provisions:
 - 1. Tower climbing apparatus shall not be located within twelve (12) feet of the ground.
 - 2. A locked anti-climb device shall be installed on the tower.
 - 3. Towers capable of being climbed shall be enclosed by a locked, protective fence at least six (6) feet high.
- J. A WECS shall have a sign posted at the base of the tower containing the following information: A high voltage warning, the manufacturer's name, an emergency phone number, and emergency shutdown procedures.
- K. A WECS shall not have affixed or attached any lights, reflectors, flashers, or any other illumination, except for illumination devices required by FAA regulations or as required by the City if within heliport arrival or departure corridors as defined by the Minnesota Department of Transportation.
- L. A WECS must comply with applicable FAA regulations and the Airport Zoning Ordinance.
- M. A WECS shall be designed and constructed so as not to cause radio and television interference.
- N. Noises emanating from the operation of WECS maintain compliance with Minnesota Pollution Control Standards.
- O. Applicant should conform to the latest Distributed Generation Interconnection Agreement and Tariff on file with Alexandria Light and Power (ALP). This agreement establishes technical requirements promoting the safe and reliable parallel operation of on-site generation resources. This is required by the State of MN (MN Statue 216B.1611) and has been adopted and set forth by ALP.

- P. Standard drawings of the structural components of the wind energy conversion system and support structures, including base and footings shall be provided along with engineering data and calculations to demonstrate compliance with the structural design provisions of the Building Code. Drawings and engineering calculations shall be certified by a Minnesota licensed engineer.
- Q. WECS electrical equipment and connections shall be designed and installed in adherence to the Electrical Code.
- R. Rooftop mounted WECS are prohibited.
- S. All WECS towers shall be white, gray, or another non-obtrusive color demonstrated to minimize visibility unless otherwise required by FAA regulations. All finishes shall be matte or non-reflective.
- T. If a WECS is not maintained in operational condition and poses a potential safety hazard, the owner shall take expeditious action to correct the situation.
- U. Any WECS or tower which is not used for twelve (12) successive months shall be deemed abandoned and shall be dismantled and removed from the property at the expense of the property owner.

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