CHAPTER 159

SMALL WIND ENERGY CONVERSION SYSTEMS

159.01 PURPOSE. The purpose of this chapter is to balance the need for clean, renewable energy resources and the necessity to protect the public health, safety and welfare of the community. The City finds these regulations are necessary to ensure that Small Wind Energy Conversion Systems are appropriately designed, sited and installed.

159.02 DEFINITIONS. For purposes of this chapter, the following definitions shall apply:

1. "dB(A)" means the sound pressure level in decibels. Refers to the "a" weighted scale defined by the American National Standards Institute (ANSI). A method for weighting the frequency spectrum to mimic the human ear.

2. "Decibel" means the unit of measure used to express the magnitude of sound pressure and sound intensity.

3. "Height, total system" means the height above grade of the system, including the generating unit and the highest vertical extension of any blades or rotors.

4. "Lot" or "parcel" means any legally established lot or parcel which contains or could contain a permitted or permitted conditional principal use as provided by Chapter 165 of this Code.

5. "Off-grid" means an electrical system that is not connected to utility distribution and transmission facilities or to any building or structure that is connected.

6. "Qualified professional installer" means an installer that is certified by the manufacturer of the SWECS as qualified to install and maintain that manufacturer's SWECS according to the manufacturer's recommendations.

7. "Shadow flicker" means changing light intensity caused by sunlight through the moving blades of a wind energy conversion system.

8. "Small wind energy conversion system (SWECS)" means a wind energy conversion system which has a nameplate rated capacity of up to 20 kilowatts for residential uses and districts and up to 100 kilowatts for commercial and industrial districts and which is incidental and subordinate to a principal use on the same parcel. Any request for a larger kilowatt than is allowed by this section shall be evaluated as a part of the Site Plan review process. A system is considered a SWECS only if it supplies electrical power solely for use by the owner on the site, except that when a parcel on which the system is installed also receives electrical power supplied by a utility company, excess electrical power generated and not presently needed by the owner for on-site use may be used by the utility company in accordance with Section 199, Chapter 15.11(5) of the *Iowa Administrative Code*, as amended from time to time.

9. "Small wind energy conversion system, free standing" means a SWECS which is elevated by means of a monopole tower only and is not located on another supporting

structure except that the tower shall have an appropriately constructed concrete base. Guyed, lattice, or other non-monopole style towers shall not meet this definition.

10. "Small wind energy conversion system, horizontal axis" means a SWECS that has blades which rotate through a horizontal plane.

11. "Small wind energy conversion system, building mounted" means a SWECS which is securely fastened to any portion of a principal building in order to achieve desired elevation, whether attached directly to the principal building or attached to a tower structure which is in turn fastened to the principal building.

12. "Small wind energy conversion system, vertical axis" means a SWECS that has blades which rotate through a vertical plane.

13. "Tower" means the vertical component of a wind energy conversion system that elevates the wind turbine generator and attached blades above the ground.

14. "Utility" or "utilities" means all underground or overhead utility lines and appurtenances including municipal water, sanitary sewers, and storm sewers as well as franchise utility services such as electric, natural gas, telephone, cable, communications and similar services.

15. "Wind energy conversion system (WECS)" means an aggregation of parts including the foundation, base, tower, generator, rotor, blades, supports, guy wires and accessory equipment such as utility interconnect and battery banks, etc., in such configuration as necessary to convert the power of wind into mechanical or electrical energy, e.g., wind charger, windmill or wind turbine.

16. "Wind turbine generator" means the component of a wind energy conversion system that transforms mechanical energy from the wind into electrical energy.

159.03 GENERAL REGULATIONS.

1. Conditional Use. A small wind energy conversion system (SWECS) shall be allowed only as a conditional accessory use to a permitted principal use as defined in Chapter 165 of the Municipal Code.

2. Zoning. SWECS may be allowed in all zoning districts subject to the provisions contained herein and elsewhere within City Code.

3. A WECS that does not meet the definition of a SWECS is prohibited within the City.

4. Permit Required.

A. It shall be unlawful to construct, erect, install, alter or locate any SWECS within the City, unless a permitted conditional use permit has been obtained from the City Manager. No such permit shall be issued until such time as a Site Plan has been approved by City Council, upon recommendation of the Planning and Zoning Commission.

B. Site Plan approval for a SWECS may be revoked by resolution of the City Council any time the approved system does not comply with the rules set forth in this chapter and the conditions imposed by the City Council.

C. The owner/operator of the SWECS must also obtain any other permits required by other federal, State, and local agencies/departments prior to constructing the system.

D. Any new structure proposed to be located within the fall zone of any existing SWECS shall require approval of an amended Site Plan for the SWECS prior to a building permit being issued for said structure unless said structure was shown on the approved Site Plan.

5. Number of Systems per Zoning Lot.

A. Residential Use. No more than one freestanding SWECS may be placed on any parcel or lot for residential use. Building mounted SWECS shall be prohibited on any parcel or lot containing a one- or two-family use unless an Iowa licensed structural engineer has completed a written analysis and certified the roof can handle the weight and stress of the SWECS without damage to the structure. If such analysis recommends improvements be made to the existing roof structure to support the SWECS, such improvements shall be required prior to issuance of the permit.

B. Multi-family Residential Use, Commercial, Industrial, and Institutional Use. No more than one freestanding SWECS may be placed on any parcel or lot with a multi-family residential, commercial, industrial, or institutional use that is taller than the tallest existing principal building located on said parcel or lot. Additional freestanding SWECS which conform to setback requirements contained herein and which are no taller than the tallest existing principal building located on said parcel or lot may be allowed on lots over seven acres in size if approved by City Council. Building mounted SWECS may be allowed within the parameters herein below provided an Iowa licensed structural engineer has completed a written analysis and certified the roof can handle the weight and stress of the SWECS without damage to the structure. If such analysis recommends improvements be made to the existing roof structure to support the SWECS, such improvements shall be required prior to issuance of the permit.

C. Mixed Use. Any building containing both residential and commercial uses or described as a “Mixed Use” building, shall be considered a commercial use for the purposes of this chapter.

6. All small wind turbines shall be certified by the Small Wind Certification Council (SWCC) as having met the requirements of the American Wind Energy Association (AWEA) for performance and safety.

7. Tower. Only monopole towers shall be permitted for freestanding SWECS. Lattice, guyed, or towers of any other type shall not be considered to be in compliance with this chapter.

8. Color. Freestanding SWECS shall be a neutral color such as white, sky blue or light gray. Building mounted SWECS shall match the color of the building on which it is mounted. Other colors may be allowed at the discretion of the City Council upon recommendation of the Planning and Zoning Commission. The surface shall be non-reflective.

9. Lighting. No lights shall be installed on the tower, unless required to meet FAA regulations.

10. Signage. At least one weatherproof warning sign, no less than eight inches by 10 inches and no more than 12 inches by 20 inches in size shall be posted on the tower base or fenced enclosure to warn of hazards and to advise against trespassing. No other

signage, graphics, or advertising of any kind shall be permitted on the tower or any associated structures including blades, turbine, generator housing, or fence enclosure other than said warning sign.

11. Climbing Apparatus. The tower must be designed to prevent climbing within the first 10 feet.

12. Installation. Installation shall be done by a qualified professional installer certified by the manufacturer of a SWECS as qualified to install and maintain that manufacturer's SWECS according to the manufacturer's recommendations.

13. Maintenance. Facilities shall be well maintained in accordance with manufacturer's specifications and shall remain in an operational condition that poses no potential safety hazard nor is in violation of any provisions contained within this chapter or elsewhere within the City Code.

14. Displacement of Parking Prohibited. The location of the SWECS shall not result in the net loss of required parking as specified in Chapter 165 of this Code of Ordinances.

15. Utility Notification. The City shall notify the utility of receipt of an application to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this notification requirement.

16. Interconnection. If connected to the grid, the SWECS shall meet the requirements for interconnection and operation as set forth by the utility and the Iowa Utilities Board. No permit of any kind shall be issued until the City has been provided with a copy of an executed interconnection agreement. Off-grid systems shall be exempt from this requirement.

17. Restriction on Use of Electricity Generated. A SWECS shall be used exclusively to supply electrical power to the owner for on-site consumption, except that excess electrical power generated by the SWECS and not presently needed for use by the owner may be used by the utility company in accordance with Section 199, Chapter 15.11(5) of the *Iowa Administrative Code*, as may be subsequently amended.

18. Noise. A SWECS shall be designed, installed and operated so that the noise generated does not exceed the 60 decibels "dB(A)" as measured at the property line of the site on which the system is located except during short-term high wind events such as utility outages and severe windstorms. The applicant shall submit a site-specific noise study or the manufacturer's engineered sound studies for review to verify that the noise level will comply with these regulations.

19. Shadow Flicker. No SWECS shall be installed and operated so to cause a shadow flicker to fall on or in the buildable area of any lot or parcel, other than the lot or parcel on which the SWECS is located. The applicant shall submit a written analysis prepared by a licensed engineer that defines the boundaries of where the shadow is cast during all seasons of the year on a site layout plan. Said analysis shall include the computer program results for review.

20. Safety Controls. Each SWECS shall be equipped with both an automatic and manual braking, governing, or feathering system to prevent uncontrolled rotation, overspeeding, and excessive pressure on the tower structure, rotor blades, or turbine components. Said automatic braking system shall also be capable of stopping turbine rotation in the event of a power outage so as to prevent back feeding of the grid or other utility approved back feed prevention control devices.

21. Shut Off. A clearly marked and easily accessible shut off for the wind turbine will be required as determined by the Building Official of the City.

22. Electromagnetic Interference. All SWECS shall be designed and constructed so as not to cause radio and television interference. If it is determined that the SWECS is causing electromagnetic interference, the owner/operator shall take the necessary corrective action to eliminate this interference including relocation or removal of the facilities, subject to the approval of the City. A permit granting a SWECS may be revoked if electromagnetic interference from the SWECS becomes evident.

23. Wind Access Easements. The enactment of this chapter does not constitute the granting of an easement by the City. The SWECS owner/operator shall have the sole responsibility to acquire any covenants, easements, or similar documentation to assure and/or protect access to sufficient wind as may or may not be necessary to operate the SWECS.

24. Insurance. The owner/operator of a SWECS must demonstrate and maintain liability insurance of not less than $1,000,000.00 coverage.

25. Engineer Certification. Applications for any freestanding or building mounted SWECS shall be accompanied by standard drawings of the wind turbine support structure, including the tower, base, and footings, or existing structure if applicable. An engineering analysis of all components of the SWECS showing compliance with the applicable regulations and certified by an Iowa licensed professional engineer shall also be submitted.

26. Installation. Installation must be done according to manufacturer's recommendations. All wiring and electrical work must be completed according to the applicable building and electric codes. All electrical components must meet code recognized test standards.

27. Removal. If the SWECS remains nonfunctional or inoperative for a continuous period of six months, the system shall be deemed to be abandoned. The SWECS owner/operator shall remove the abandoned system at their expense. Removal of the system includes the entire structure, transmission equipment and fencing from the property excluding foundations. Non-function or lack of operation may be proven by reports from the interconnected utility. For off-grid systems the City shall have the right to enter the property at its sole discretion to determine if the off-grid system is generating power. Such generation may be proven by use of an amp meter. The SWECS owner/operator and successors shall make available to the City all reports to and from the purchaser of energy from the SWECS if requested. If removal of towers and appurtenant facilities is required, the City shall notify the SWECS owner/operator. Removal shall be completed within six months of written notice to remove being provided to the owner/operator by the City.

28. Right Of Entrance. As a condition of approval of a Conditional Use Permit an applicant seeking to install SWECS shall be required to sign a petition and waiver agreement which shall be recorded and run with the land granting permission to the City to enter the property to remove the SWECS pursuant to the terms of approval and to assure compliance with the other conditions set forth in the permit. Removal shall be at the expense of the owner/operator and the cost may be assessed against the property.

29. Feasibility Study. It is highly recommended that a feasibility study be made of any site prior to installing a wind turbine. The feasibility study should include measuring actual wind speeds at the proposed turbine site for at least three months.

30. Restrictive Covenants. Deeds for property located in subdivisions approved after the date of the ordinance codified in this chapter shall not contain restrictive covenants that include unreasonable restrictions on the use of SWECS.

159.04 BULK REGULATIONS.

1. Setbacks.

A. The minimum distance between any freestanding SWECS and any property line shall be a distance that is equivalent to 125 percent of the total system height. The setback shall be measured from the property line to the point of the SWECS closest to the property line.

B. The required setback for any building mounted SWECS shall be equal to the required setback of the principal building to which the SWECS is to be attached at such time that the application to install a building mounted SWECS is received by the City.

2. Maximum Height. Height shall be measured from the ground to the top of the tower, including the wind turbine generator and blades.

A. For lots of more than one and fewer than three acres, the maximum height shall be 65 feet.

B. For lots of three to seven acres, the maximum height shall be 80 feet.

C. For lots of more than seven acres, the maximum height shall be 100 feet.

D. Building mounted SWECS on single-family dwellings, two-family dwellings and townhomes may be a maximum of 10 feet higher than the point of attachment to the building on which they are attached.

E. Building mounted SWECS on multi-family, mixed use, commercial, or industrial buildings may be a maximum of 20 feet higher than the point of attachment to the building on which they are attached.

3. Minimum Lot Size.

A. The minimum lot size for a freestanding SWECS shall be one acre.

B. The minimum lot size for a building mounted SWECS shall be one acre for any building of less than five stories in height.

C. There shall be no minimum lot size for building mounted SWECS to be mounted on buildings of five or more stories in height.

4. Clearance of Blade. No portion of a horizontal axis SWECS blade shall extend within 30 feet of the ground. No portion of a vertical axis SWECS shall extend within 10 feet of the ground. No blades may extend over parking areas, driveways or sidewalks. No blade may extend within 20 feet of the nearest tree, structure or above ground utility facilities.

5. Location.

A. No part of a SWECS shall be located within or over drainage, utility or other established easements.

B. A freestanding SWECS shall be located entirely in the rear yard for all residential uses, including mixed use buildings comprising residential uses. A

freestanding SWECS for all other uses shall be situated in a location appropriate to the property and setting and shall be determined through the site plan review process.

C. A SWECS shall be located in compliance with the guidelines of applicable Federal Aviation Administration (FAA) regulations as amended from time to time.

D. No SWECS shall be constructed so that any part thereof can extend within 20 feet laterally of an overhead electrical power line (excluding secondary electrical service lines or service drops). The setback from underground electric distribution lines shall be at least 10 feet.

E. Building mounted SWECS shall be prohibited unless the owner has obtained a written analysis from an Iowa licensed structural engineer determining that the SWECS can be securely fastened so as to not pose a hazard caused by detaching from the structure.

159.05 SITE PLAN REQUIRED.

1. The applicant shall submit a site plan in general conformance to the procedures and requirements of Chapter 157 of this Code of Ordinances.

2. The site plan shall include:

A. Location of the SWECS on the site and total height of the system, including blades, rotor diameter, and ground clearance;

B. The area of the base of each tower and depths;

C. Utility lines, telephone lines, and any other lines, both above and below ground, within a radius of 200 feet from the tower base;

D. Details as to how the power will be delivered to the grid, including the route and size of poles and towers to be used;

E. Property lot lines, land uses, trees, and the location and dimensions of all existing structures and uses on and off site within a radius of 200 feet from the tower base;

F. All required setbacks for freestanding or building-mounted SWECS, whichever is applicable;

G. The shadow boundary line in accordance with the flicker shadow study, along with the location of any dwelling or structure located inside the boundary of the defined shadow or within 50 feet of the limits of the defined shadow;

H. Noise level analysis, based on a site-specific noise study by a licensed engineer or the manufacturer’s engineered sound studies;

I. The property lines for all parcels located within 250 feet of the edge of the property on which the SWECS will be located and the names of all property owners of said parcels;

J. A line drawing of the electrical components in sufficient detail to allow for a determination that the manner of the installation conforms to the *National Electric Code*; and

K. Design data for the system indicating the basis of design, including manufacturer's dimensional drawings and installation and operation instructions.

3. Prior to considering a site plan for a SWECS, the Planning and Zoning Commission shall hold a public hearing. Notification of the public hearing shall be published as specified elsewhere in this Code of Ordinances. The City Clerk shall mail notification of the public hearing to all property owners of parcels located within 250 feet of the edge of the property on which the SWECS will be located. The applicant shall provide all necessary stamped and addressed envelopes to the City Clerk for such purpose.

4. Following public hearing, the Planning and Zoning Commission shall make their recommendation to Council for approval, approval with conditions, or denial of the Site Plan. The City Council shall then take action to approve or deny the Site Plan.

159.06 PERMIT REQUIRED.

1. Application for SWECS permit shall be made on forms provided by the City.

2. Fees for a SWECS permit shall be in accordance with a fee schedule adopted from time to time by resolution of the City Council.

3. No SWECS permit application shall be approved until the Site Plan has been approved by City Council.

4. No action may be taken regarding requests for SWECS, including the commencement of construction, until such time as the permit has been approved by the City Manager and all fees have been paid.

5. All SWECS permit applications shall be renewed on July 1 of each year. Every third year and prior to the City Manager's approval of said renewal, the applicant shall provide written certification from an Iowa licensed professional engineer stating that the SWECS is in compliance with all federal, State, and local codes, including all requirements of this chapter. The cost for the annual renewal of the permit will be stated in a resolution as from time to time adopted by the Council.

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