

1.0340.2 DEFINITIONS

The following terms and definitions are applicable to this Ordinance Section:

Ambient Sound Level. The amount of background noise at a given location prior to the installation of exterior machinery. The ambient sound level may include, but not limited to, traffic, machinery, lawnmowers, human activity, and the interaction of wind with the landscape. The ambient sound level is measure on the dB(A) weighted scale as defined by the American National Standards Institute (ANSI).

MET (Anometer) Tower: The temporary wind speed indicator constructed for the purpose of analyzing the potential for utilizing a wind energy tubine at a given site. This includes the tower base plate, anchors, cables and hardware, wind direction vanes, booms to hold equipment, data logger, instrument wiring, and any telemetry devices that are used to monitor or transmit wind speed and wind flow characteristics over a period of time for either instantaneous wind information or to characterize the wind resource at a given location.

Decommissioning: The process of terminating operation and completely removing a WES and all related buildings, structures, foundations, access roads, and equipment.

Nacelle: The encasement that houses all of the generating components, gear box, drive tram, and other equipment.

Net Metering: A special metering and billing agreement between utility companies and their customers, which facilitates that connection of renewable energy generating systems to the power grid.

Occupied Building: A residence, church, business, or other building used for public gatherings.

Operator: The entity responsible for the day-to-day operation and maintenance of a WES.

Owner: The individual or entity, including their respective successors and assigns, that have an equity interest in or own the WES in accordance with this ordinance.

Rotor: An element of a wind energy system that acts as a multi-bladed airfoil assembly which attracts, through rotation, kinetic energy directly from the wind.

Rotor Diameter: The cross-sectional dimension of the circle swept by the rotating blades of a WES.

Scada Tower: A freestanding tower containing instruments such as anemometers that is designed to provide present moment wind data for use by a Supervisory Control and Data (SCADA) system.

Shadow Flicker: The moving shadow, created by the sun shining through the rotating blades of a WES. The amount of shadow flicker created by a WES is calculated by a computer model that takes into consideration turbine location, elevation, tree cover, location of all structures, wind activity, and sunlight.

Small Tower-Mounted Wind Energy System: A tower-mounted wind energy system that converts wind energy into electricity through the use of equipment that includes any base, blade, foundation, generator, Nacelle, rotor, tower, transformer, vane, wire, inverter, batteries or other components used in the system. The Small Tower-Mounted Wind Energy System has a nameplate capacity that does not exceed thirty (30) kilowatts. The total height does not exceed 80 feet.

Small Structure-Mounted Wind Energy System: Converts wind energy into electricity through the use of equipment that includes any base, blade, foundation, generator, Nacelle, rotor, tower, transformer, vane, wire, inverter, batteries or other components used in the system. A Small Structure-Mounted Wind Energy System is attached to a structure's roof, walls, or other elevated surface. The Small Structure-Mounted Wind Energy System has a nameplate capacity that does not exceed ten (10) kilowatts. The total height does not exceed fifteen (15) feet as measured from the highest point of the roof.

Survival Wind Speed: The maximum wind speed, as designated by the Wind Energy Conversion System manufacturer, at which a WECS, in unattended operation (not necessarily producing power) is designed to survive without damage to structural equipment or the loss of the ability to function normally.

Total Height: The vertical distance measured from the ground level at the base of the tower to the uppermost vertical extension of any blade, or the maximum height reached by any part of the WES.

Tower: A freestanding monopole that supports a Wind Energy System (WES).

Tower Height: The vertical distance measured from the ground level at the base of the tower to the uppermost vertical extension of any blade, or the maximum height reached by any part of the Wind Energy System (WES).

Township: Manlius Township, Allegan County.

Upwind Turbine: A WES positioned in a manner so that the wind hits the turbine blades before it hits the tower in order to avoid the thumping noise that can occur if the wind is disrupted by hitting the tower before the blades.

Wind Energy System (WES): A structure that converts wind energy into electricity through the use of a wind turbine generator and includes the turbine, blades, and/or tower as well as related electrical equipment and supporting wires. This does not include wiring to connect the wind energy system to the electrical grid.

A Wind Energy System consists of a combination of:

- (1) A surface area, either variable or fixed, for utilizing the wind for electrical power generation; and
- (2) A shaft, gearing, belt, or coupling utilized to convert the rotation of the surface area into a form suitable for driving a generator, alternator, or other electricity producing device; and
- (3) The generator, alternator, or other device to convert the mechanical energy of the surface area into electrical energy; and
- (4) The tower, pylon, or other structure upon which any, all, or some combination of the above are mounted.

Wind Energy System, Farm: An "interconnected wind energy system", consisting of two (2) or more wind energy production structures with an energy production capacity in excess of **250** kilowatts.

Wind Energy System, Interconnected: A WES which is electrically connected to the local electrical power utility and able to feed back power into the local electrical power utility grid.

Wind Energy System, Utility Grid: A structure designed and built to provide electricity to the electric utility grid.

Wind Site Assessment: An assessment to determine the wind speeds at a specific site and the feasibility of using that site for construction of a wind energy system.

1.0340.3. REGULATIONS FOR SINGLE ON-SITE USE WIND ENERGY TOWERS

- (A) The following shall apply only to a single Wind Energy Tower intended for on-site energy consumption within the property on which it is located. Water pumping and ornamental wind devices, which are not WES, shall be exempt from this Section so long as they do not exceed the height limitations and other provisions for permitted accessory structures of this ordinance.
- (B) An On-Site Use Wind Energy System is intended to serve an individual property only. Upwind turbines shall be required. Tower heights not exceeding 80 feet shall be a permitted use in all zoning classifications subject to the following regulations.
- (C) Submittal Requirements:
- (1) A Zoning Permit Application shall be submitted to the Zoning Administrator with the following required information:
- (a) Name of property owner(s), address, and parcel number.
 - (b) A site plan that includes maps (drawn to scale) showing proposed location of all components and ancillary equipment of the On-Site Use WES, property lines, physical dimensions of the property, existing building(s) setback lines, right-of-way lines, public easements, overhead utility lines, sidewalks, non-motorized pathways, roads and contours. The site plan must also include adjoining properties as well as the location and use of all structures thereon.
 - (c) The proposed type, height, and number of the On-Site Use WES to be constructed; including the manufacturer and model, product specifications including maximum noise output (measured in decibels), total rated generating capacity, dimensions, rotor diameter, and a description of ancillary facilities.
 - (d) Documented compliance with the noise and shadow flicker requirements set forth in this Ordinance. [Shadow flicker and noise requirements found later in this section at (C)(8) and (9).]

- (e) Documented compliance with applicable local, state, and national regulations including, but not limited to, all applicable safety, construction, environmental, electrical, and communications requirements.
- (f) Documented compliance with Federal Aviation Administration (FAA) requirements, the Michigan Airport Zoning Act (Public Act 23 of 1950, MCL 259.431 et seq.) and the Michigan Tall Structures Act (Public Act 259 of 1959, MCL 259.481 et seq.).
- (g) Evidence that the utility company has been informed of the customer's intent to install an interconnected, customer-owned generator and that such connection has been approved. Off-grid systems shall be exempt from this requirement.
- (h) A description of the methods that will be used to perform maintenance on the on-site small structure-mounted WES and small tower-mounted WES and the procedures for lowering or removing the on-site small tower-mounted WES in order to conduct maintenance.
- (i) Proof of building and electrical permits.
- (j) Proof of applicant's liability insurance.
- (k) Other relevant information as may be reasonably requested.
- (l) Signature of the Applicant.
- (m) Property owner must abide by terms of permit and will be liable for violations of said permit.

(2) Height, location, minimum lot size and property setbacks for small on-site use structure mounted WES and for small on-site use tower-mounted WES (not structure-mounted).

- (a) Small On-Site Use Structure Mounted WES:
 - (i) Height: The total height of On-Site Use Small Structure- Mounted WES shall not exceed fifteen (15) feet as measured from the highest point of the roof.

- (ii) **Setback:** The setback of the On-Site Use Small Structure-Mounted WES shall be a minimum of fifteen (15) feet from the property line, public right-of-way, public easement, or overhead utility lines if mounted directly on a roof or other elevated surface of a structure. If the On-Site Use Small Structure-Mounted WES is affixed by any extension to the side, roof, or other elevated surface, then the setback from the property line or public right-of-way shall be a minimum of fifteen (15) feet. The setback shall be measured from the furthest outward extension of all moving parts.
 - (iii) **Separation:** If more than one On-Site Use Small Structure-Mounted WES is installed, a distance equal to the height of the highest On-Site Use Small Structure-Mounted WES must be maintained between the base of each On-Site Use Small Structure-Mounted WES.
 - (iv) **Location:** The On-Site Use Small Structure-Mounted WES shall not be affixed to the wall on the side of a structure facing a street or private road.
- (b) **On-Site Use WES on Towers (not structure mounted):**
- (i) **Height:** The total height of an On-Site Use Small Tower-Mounted WES shall not exceed 80 feet.
 - (ii) **Location.** The On-Site Use Small Tower-Mounted WES shall only be located in a rear yard of a property of at least one acre in area that has an occupied building.
 - (iii) **Occupied Building Setback:** The setback from all occupied buildings on the applicant's parcel shall be a minimum of twenty (20) feet measured from the base of the Tower.
 - (iv) **Other Setbacks:** The setback shall be equal to the Total Height of the On-Site Use Small Tower-Mounted WES, as measured from the base of the Tower, from the property line, public right-of-way, public easement, or overhead public utility lines.