

Wind Energy Development Shadow Flicker Regulations Across Michigan

Community	Requirement	Additional Requirements/ Study Requirements
Shiawassee County	None	N/A
Akron Township (2009)	A copy of the Shadow Flicker analysis.	The applicant shall conduct an analysis on potential shadow flicker at occupied structures . The analysis shall identify the locations of shadow flicker that may be caused by the project and the expected durations of the flicker at these locations from sun-rise to sun-set over the course of a year. The analysis shall identify problem areas where shadow flicker may affect the occupants of the structures and describe measures that shall be taken to eliminate or mitigate the problems.
Banks Township, Antrim County (Amended 2010)	Landscaping shall be designed to counter the effects of “shadow flicker” on any neighboring residences or roadways caused by the rotor rotation in the sunlight.	None.
Bridgehampton Twp., Sanilac County UPDATED 6.14.17 (As posted on 6.12.17 at http://www.bridgehamptontownship.net/)	A shadow flicker analysis including the expected durations of flicker at all inhabitable structures within a direct line-of-sight. Site plans shall depict a contour around each proposed wind turbine that represents the predicted thirty (30) hours per year shadow flicker generated by the modeling software used in the report. The analysis shall identify all areas where shadow flicker may affect the occupants of the inhabitable structures and describe measures that shall be taken to eliminate or mitigate the problems. A shadow flicker mitigation plan shall also be submitted with the shadow flicker modeling report.	. Any shadow flicker complaint shall be addressed by the applicant and be mitigated. All turbines to be equipped with a shadow detection system, such as the Vestas Shadow Detection System (VS DS) or equivalent. Shadow Flicker on non-participating properties shall not be allowed.
Centerville Township, Leelanau County (Amended 2015)	A WECS shall be designed to minimize shadow flicker from moving blades or reflected blade glint occurring off the site on which the facility is located. Should shadow flicker or blade glint be expected to fall on a portion of an off-site property, the system may be operated within the following conditions: 1) Shadow flicker cannot exceed 30 hours per year on an off-site property; 2) Shadow flicker will fall more than one hundred (100) feet from an existing residence, unless the affected property owner has signed a written agreement with the owner-operator; Should any of these requirements be violated the township zoning administrator or township designee shall evaluate the situation.	A shadow flicker and blade glint analysis and computer simulation or model including topography and structures. The analysis and model shall identify the locations of shadow flicker and blade glint caused by the wind energy system and the expected durations of the shadow flicker and blade glint at these locations from sunrise to sunset over the course of a year. The analysis and model shall identify problem areas where shadow flicker or blade glint may affect parcels of land, roadways, and existing or future structures. The analysis and model also shall describe measures that shall be taken to eliminate or mitigate the problems, including, but not limited to, a change in siting of the facility, a change in the operation of the facility, or grading or landscaping mitigation measures.
City of Ionia, Ionia County (Amended 2010)	The Planning Commission or Community Development Director may request a shadow flicker analysis.	Shadow flicker analysis shall identify locations of shadow flicker that may occur, and shall describe measures such as screening that shall be taken to eliminate or minimize the shadow flicker.

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City of Walker, Kent County (FOR MEDIUM AND LARGE WIND ENERGY OPERATIONS)	The Owner/Applicant shall conduct an analysis of potential shadow flicker onto any occupied building with direct line of sight to the M-WET or LWET.	The analysis shall identify the locations of Shadow Flicker that may be caused by the WET and the expected durations of the Flicker at these locations from sun-rise to sun-set over the course of a year. The analysis shall identify situations where Shadow Flicker may affect the occupants of the buildings for more than 30 hours per year, and describe measures that shall be taken to eliminate or mitigate the problems. Shadow Flicker on a building shall not exceed 30 hours per year.
Claybanks Township, Oceana County	A Wind Energy Harvest Site shall be designed and sited to prevent reflection from having a negative impact on any shadow flicker receptor, as defined herein.	<p>1) A site shall be designed so that shadow flicker does not impact any shadow flicker receptor for more than 10 hours per year.</p> <p>2) Based on demonstrably valid complaints, field verification and modeling by a qualified consultant, if necessary, shall be paid for by the owner/operator and hired independently by the Planning Commission.</p> <p>3) The Owner/Operator shall be responsible for mitigating the problem within 30 days from the determination of an issue. 90 days shall be given if significant construction or physical modification.</p>
Cleveland Township, Leelanau County	None.	None.
Clinton County (FOR UTILITY SCALE OPERATIONS)	The applicant shall provide a detailed report including a visual site plan illustrating potential shadow areas produced by a [WECS].	Shadow flicker report shall include, but not be limited to, the number of hours per day per year and mechanisms or mitigation efforts that could be implemented to minimize any negative effects.
Emmet County	A facility shall be designed such that shadow flicker will not be visible on, or in, an existing off-site dwelling. The applicant must provide a shadow flicker analysis.	<p>Shadow flicker analysis shall include:</p> <p>1) Map and describe within a one-mile radius of the proposed project site the topography, existing residences, locations of other structures, wind speeds and directions, existing vegetation and roadways; 2) The model shall represent the most probable scenarios of wind constancy, sunshine constancy, wind directions and speeds, moon positions and reflection directions; 3) Calculate the locations of shadow flicker caused by the proposed project and the expected durations of the flicker at these locations; 4) Calculate the total number of hours per year of flicker at all locations; 5) Identify problem areas where shadow flicker will interfere with existing or future residences and roadways and describe proposed measures to mitigate these problems, including, but not limited to, a change in site location of the facility, a change in the operation of the facility, or grading or landscaping mitigation measures. 6) The facility shall be designed such that shadow flicker will not be visible on, or in, any existing dwelling. Shadow flicker expected to be visible on a roadway or a portion of a residential parcel may be acceptable under the following circumstances: (a) The flicker will not exceed 30 hours per year; and (b) The flicker will not be visible within 100 feet from a structure designed for human occupancy; and (c) The flicker will not be visible on a county primary road, or state or federal highway.</p>
Fenton Charter Township, Genesee County	Site Plan and other documents and drawings shall show mitigation measures to minimize potential impacts from shadow flicker.	None.
Gratiot County	Wind turbines shall be placed such that shadow flicker to any occupied buildings occurs no more than 30 hours per year.	None.

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Huron County UPDATED 6.14.17	Shadow flicker measured at the nearest external wall or walls of BOTH participating and non-participating inhabited structures shall be limited to 30 hours per year.	In the event that actual shadow flicker exceeds the standard written consent from affected property owner(s) shall be obtained stating that they are aware of shadow flicker regulations and that shadow flicker may exceed those limits. All written consent must be recorded with the Huron County Register of Deeds.
Lowell Township, Kent County (DRAFT ORDINANCE)	The Planning Commission may request that the applicant preform an analysis of potential shadow flicker. The analysis shall identify locations of shadow flicker that may occur, and shall describe measures such as screening that shall be taken to eliminate or minimize the shadow flicker.	None.
Manchester Township, Washtenaw County	None.	None.
Oliver Township, Huron County	A copy of the Shadow Flicker analysis.	1) The applicant shall conduct an analysis on potential shadow flicker at occupied structures. 2) The analysis shall identify the locations of shadow flicker that may be caused by the project and the expected durations of the flicker at these locations from sun-rise to sun-set over the course of the year. 3) The analysis shall identify problem areas where shadow flicker may affect the occupants of the structures and describe measures that shall be taken to eliminate or mitigate the problems.
Osceola Township, Osceola County	None.	None.
Otsego County	Small, medium, and large Wind Turbine Generators (WTG) shall be designed, sited and operated in such a manner to minimize shadow flicker on a roadway and to prevent shadow flicker on any existing structures located off the property on which the WTG is erected. The owner/operator shall prohibit shadow flicker on any future lawfully constructed structure located off the property on which the WTG is erected.	1) Written documentation projecting the shadow flicker on any existing structures located off the property on which the Large WTG will be constructed, and the extent and duration of the flicker on these existing structures. 2) If necessary to prevent shadow flicker from crossing occupied structures the large WTG may be programmed to stop rotating during times the large WTG shadow crosses these structures. 3) The large WTG operator may obtain a written easement or other written agreement which specifically allows shadow flicker to cross an occupied structure.
White River Township, Muskegon County	All efforts shall be made not to affect any resident with any strobe effect.	None.
Wilson Township, Charlevoix County	The Commercial WG shall be designed and sited in such a manner to minimize shadow flicker expected to fall on a roadway and on any existing structures located off the property on which the Commercial WG is constructed.	Written documentation establishing whether the proposed Commercial Wind Development location on the site will create shadow flicker on any existing structures located off the property on which the Commercial WG will be constructed, and if so, the extent and duration of the shadow flicker on these existing structures and the steps to be taken to minimize the shadow flicker on these existing structures.