

**Acoustics, Environmental Sound & Industrial Noise**

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Date: April 27, 2016  
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Ref: WNTAG Member Noise Regulation Recommendation

**Applicability:** All noise generated by industrial, commercial, manufacturing, power generation and bulk transmission of energy resource facilities. Exempt noise sources are for emergency equipment, public safety devices, and vehicle backup alarms.

**Intent:** This regulation preserves quality of life, peace and tranquility, and protects the natural environment from exposure to excessive noise(s) by limiting the noise level increase and objectionable sound quality.

**Limits:** Baseline L90 (LAeq1hr) noise levels are established by measurements for the quietest hours of operation prior to permitting and construction at locations where quiet would be expected. Baseline L90 noise levels shall exclude all wind caused noise contamination. The established baseline L90 noise levels shall be used for determining noise compliance. The maximum allowed noise level (approx. L01) increase is 10 dB above the lowest baseline L90 (LAeq1hr) established prior to permitting and construction.

**Sound Quality Corrections:** Noise from commercial and industrial operation(s) shall not contain objectionable sound quality characteristics, as defined below. When present, a 5 dB penalty shall be applied for each sound quality infraction to a maximum of 15 dB.

Sound Quality Corrections	Description	Method	Penalty	
a	Excessive Variation	Amplitude Modulation	Difference: L90 to L01 > 10 dB	+5 dBA
b	Tone(s)	1 Steady Tone	ANSI S1.13; 1/3 Octave Band	+5 dBA
		Fluctuating Tone	ANSI S1.13; Narrow Band	
		Multiple Tones		
c	Low Frequency	20 Hz to 10000 Hz	Difference: dBC minus dBA >15 dB	+5 dBA
d	Infrasound	0.15 Hz to 20 Hz	Difference: dBL minus dBC >15 dB	+5 dBA

**Compliance:** Noise measurements are the financial responsibility of the project owner and shall be independently performed by a qualified professional when directed by the MassDEP or Town officials; Code Enforcement, Planning or Zoning Boards. Compliance noise measurements shall not exceed the 10 dB increase noise limit and shall include the justified Sound Quality Corrections. Noise measurements shall prevail versus noise predictions.

**Measurements:** Test sites shall be away from roads or other localized sound sources including transient events. All noise measurements shall exclude contributions from wind on microphone, tree/leaf rustle, flowing water, and natural sounds such as birds, tree frogs, and insects. Natural sounds are excluded by calculating dBA from 1/1 and 1/3 octave band measurements below 1250 Hz.

**Predictions:** The project owner and consultants are responsible for predicting wind turbine noise levels without wind. Noise predictions must represent the maximum noise level (L01) produced by amplitude modulation.

**References:** *This noise regulation requires that all acoustic terminology, noise predictions and sound measurements shall comply with recognized international standards (ANSI, IEC & ISO) including:*

1. ANSI/ASA S3/SC1.100-2014 (ANSI/ASA S12.100-2014) Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas
2. ANSI/ASA S12.9-2013/Part3 Quantities and Procedures for Description and Measurement of Environmental Sound-Part 3: Short-term Measurements with an Observer Present
3. ANSI-ASA\_S12.62 (ISO9613-2) Acoustics-Attenuation of sound during propagation outdoors - Part 2: General Method of Calculation