

This **Chapter §216 Wireless Regulations** is intended to repeal and replace all previous versions of, and amendments to, Chapter §216 of the General ByLaws of the Town of Sheffield, all of which are hereby repealed and replaced in their entirety by this Chapter 216 et. seq., as of the effective date hereof.

No personal wireless service facility (PWSF) shall be sited, constructed, reconstructed, installed, materially changed or altered, expanded, or used unless in conformity with this section.

CHAPTER 216 Sheffield, Massachusetts Telecommunications By-law

216-1 DEFINITIONS:

“Commercial Radio Service (CRS) facility: a facility consisting of one or more of the following: a radio frequency configuration, wireless antenna (regardless of size), support structures (including telephone/electricity/cable poles as well as Commercial Radio Service (CRS) towers), equipment storage shelters, and accessory equipment required for the reception, switching, and/or transmission of wireless telecommunications including, but not limited to, paging, enhanced specialized mobile radio, personal communications services, cellular telephones, so called “small cell installations” – and similar technologies, but excluding personal and/or small business cell phone systems. For the purposes of this by-law, “CRS Facility” includes “Small Cell Installation, except for those sections of this Section 16 listed below in subsection 16.3.25.”

“Small Cell Installation” means all equipment required for the operation and maintenance of so-called “small cell” wireless communications systems that transmit and/or receive signals – designed to provide network coverage to small areas as opposed to tall, high-power, “macro” towers which serve a wide area”.

216-2 GENERAL REQUIREMENTS:

“216-2A Notwithstanding any other provision of this Section 16, the following subsections of this Section 16 shall not apply to Small Cell Installations: 16.3.8; 16.3.0; 16.3.16; 16.7.”

“216-2B. Small Cell Installations may not be co-located with other CRS facilities.” “16.3.27. All CRS facilities shall comply with applicable FCC rules regarding acceptable limits on radio small cell frequency radiation exposure to the general public as determined by a qualified radio frequency engineer.” [see attachment]

216-2C FACILITIES OUTSIDE THE *CRSOD*:

216-2D. FACILITIES PERMITTED OUTSIDE THE *CRSOD*:

“216-2C FACILITIES OUTSIDE THE *CRSOD*:

The installation of building, roof or wall-mounted CRS facilities, other than Small Cell Installations, which are subject to Subsection 16.3 and Subsection 4.1 of this bylaw provided that: No equipment, antennae, or structures associated with the CRS facility shall exceed 10 feet above the height of the building or 100 feet above the ground, whichever is less; AND all antennas and accessory equipment shall be fully screened to be harmonious and architecturally compatible with the building, including but not limited to painting equipment to match the building.”

D. FACILITIES REQUIRING A SPECIAL PERMIT OUTSIDE THE CRSOD:

“Outside the CRSOD, a special permit shall be required for all new CRS facilities, except as set forth in Subsections 16.5.B and 16.6 of this bylaw. However, because each individual Small Cell Installation will have unique impacts on the Town depending on its specific location, each such installation shall require a separate special permit.”

216-3 PERFORMANCE GUARANTEES AND FEES:

Prior to issuance of a Building Permit for a *CRS facility*, the applicant is required to post with the Town Treasurer a bond or other form of financial security for an amount up to \$50,000.00, as set forth by the ZBA. The bond will be to cover demolition in the event that the Building Inspector condemns the tower or parts thereof or accessory facilities and structures or deems it unused continuously for more than a year. The Building Inspector shall give the applicant 90 days written notice in advance of any demolition action. In addition, a separate \$10,000.00 bond shall be required for each Small Cell Installation. This bond(s) will be held as a guarantee that no such installation exceeds or will exceed the allowable FCC limits for radio frequency radiation exposure to the general public as determined by a qualified radio frequency engineer.”
Petition:

216-4A Rules and Regulations: Pursuant to Section 9 of Chapter 40A of the Massachusetts General Laws, the SPGA shall adopt rules relative to the issuance of Special Permits. The SPGA’s Rules and Regulations may relate to the size, form, content and style of the plans, fees, and procedures for submission and approval of such Special Permits, and shall not be inconsistent with the General Laws and provisions of this Bylaw. The SPGA shall from time to time amend these rules. Copies of the rules shall be on file and available for review at the office of the Town Clerk. Copies of Special Permit Applications and related documents shall be submitted to the Board of Health, the Planning Board, the Conservation Commission, and the Selectboard who shall have 35 days within which to comment.

§260-64(S) Prohibition Against Illegally Excessive Emissions and RF Radiation Testing

As disclosed upon the FCC’s public internet website, personal wireless services facilities erected at any height under 200 feet are not required to be registered with the FCC.

Of even greater potential concern to the Town is the fact that the FCC does not enforce the RF radiation limits codified within the CFR by either: (a) testing the actual radiation emissions of wireless Facilities either at the time of their installation or at any time thereafter, or (b) requiring their owners to test them. Relevant excerpts from the FCC’s public internet website are in a document available in the Sheffield Town Clerk’s office.

This means that when wireless Facilities are constructed and operated within the Town, the FCC will have no idea where they are located and no means of determining, much less ensuring, that they are not exposing residents within the Town and/or the general public to Illegally Excessive levels of RF Radiation.

The Town deems it to be of critical importance to the health, safety, and welfare of the Town, its residents, and the public at large that personal wireless service facilities do not expose members of the general public to levels of RF radiation that exceed the limits which have been deemed safe by the FCC, and/or are imposed under CFR.

In accord with the same, the Town enacts the following RF Radiation testing requirements and provisions set forth herein below.

No wireless telecommunications facility shall at any time be permitted to emit illegally excessive RF Radiation as defined in §260-64(B), or to produce power densities that exceed the legally permissible limits for electric and magnetic field strength and power density for transmitters, as codified within 47 CFR §1.1310(e)(1), Table 1 Sections (i) and (ii), as made applicable pursuant to 47 CFR §1.1310(e)(3).

To ensure continuing compliance with such limits by all owners and/or operators of personal wireless service facilities within the Town, all owners, and operators of personal wireless service facilities shall submit reports as required by this section.

As set forth hereinbelow, the Town may additionally require, at the owner and/or operator's expense, independent verification of the results of any analysis set forth within any reports submitted to the Town by an owner and/or operator.

If an operator of a personal wireless service facility fails to supply the required reports or fails to correct a violation of the legally permissible limits described hereinabove, following notification that their respective facility is believed to be exceeding such limits, any Special Use Permit or other zoning approval granted by the Planning Board or any other Board or representative of the Town is subject to modification or revocation by the Planning Board following a public hearing.

1. Initial Certification of Compliance with Applicable RF Radiation Limits

Within forty-five (45) days of initial operation or a substantial modification of a personal wireless service facility, the owner and/or operator of each Telecommunications antenna shall submit to the Building Inspector a written certification by a licensed professional engineer, sworn to under penalties of perjury, that the facility's radio frequency emissions comply with the limits codified within 47 CFR §1.1310(e)(1), Table 1 Sections (i) and (ii), as made applicable pursuant to 47 CFR §1.1310(e)(3).

The engineer shall measure the emissions of the approved facility, including the cumulative impact from other nearby Facilities, and determine if such emissions are within the limits described hereinabove.

A report of these measurements and the engineer's findings with respect to compliance with the FCC's Maximum Permissible Exposure (MPE) limits shall be submitted to the Building Inspector.

If the report shows that the facility does not comply with applicable limits, then the owner and/or operator shall cease operation of the facility until the facility is brought into compliance with such limits. Proof of compliance shall be a certification provided by the engineer who prepared the original report. The Town may require, at the applicant's expense, independent verification of the results of the analysis.

2. Random RF Radiofrequency Testing

At the operator's expense, the Town may retain an engineer to conduct random unannounced RF Radiation testing of such Facilities to ensure the facility's compliance with the limits codified within 47 CFR §1.1310(e)(1) et seq.

The Town may cause such random testing to be conducted as often as the Town may deem appropriate. However, the Town may not require the owner and/or operator to pay for more than one test per facility per calendar year unless such testing reveals that one or more of the owner and/or operator's facilities are exceeding the limits codified within 47 CFR §1.1310(e)(1) et seq., in which case the Town shall be permitted to demand that the facility be brought into compliance with such limits, and to conduct additional tests to determine if, and when, the owner and/or operator thereafter brings the respective facility and/or facilities into compliance.

If the Town at any time finds that there is good cause to believe that a personal wireless service facility and/or one or more of its antennas are emitting RF radiation at levels in excess of the legal limits permitted under 47 CFR §1.1310(e)(1) et seq., then a hearing shall be scheduled before the Planning Board at which the owner and/or operator of such facility shall be required to show cause why any and all permits and/or approvals issued by the Town for such facility and/or facilities should not be revoked, and a fine should not be assessed against such owner and/or operator.

(1) Table 1 to [§ 1.1310\(e\)\(1\)](#) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

TABLE 1 TO [§ 1.1310\(E\)\(1\)](#) - LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/ <u>f</u>	4.89/ <u>f</u>	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			<u>f</u> /300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/ <u>f</u>	2.19/ <u>f</u>	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30

300-1,500			$f/1500$	<30
1,500-100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

(2) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are [fully aware](#) of the potential for exposure and can exercise control over their exposure. The phrase *fully aware* in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of *transient* persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. In situations when an untrained person is transient through a location where occupational/controlled limits apply, he or she must be made aware of the potential for exposure and be supervised by trained personnel pursuant to [§ 1.1307\(b\)\(2\)](#) of this part where use of time averaging is required to ensure compliance with the general population exposure limit. The phrase *exercise control* means that an exposed person is allowed and also knows how to reduce or avoid exposure by administrative or engineering work practices, such as use of personal protective equipment or time averaging of exposure.

(3) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be [fully aware](#) of the potential for exposure or cannot exercise control over their exposure. For example, RF sources intended for consumer use shall be subject to the limits for general population/uncontrolled exposure in this section.

[[85 FR 18145](#), Apr. 1, 2020]

Signal Strength (dBm)	Power Density ($\mu\text{W}/\text{m}^2$)	Compare vs. 5-Bars	Land of ...
30 dBm	580,000,000 $\mu\text{W}/\text{m}^2$		Land of Wireless Broadband (No 1996-TCA Preemption of Local Authority)
25 dBm	180,000,000 $\mu\text{W}/\text{m}^2$	100,000,000,000x higher	
20 dBm	58,000,000 $\mu\text{W}/\text{m}^2$		
15 dBm	18,000,000 $\mu\text{W}/\text{m}^2$	10,000,000,000x higher	
10 dBm	5,800,000 $\mu\text{W}/\text{m}^2$		
5 dBm	1,800,000 $\mu\text{W}/\text{m}^2$	1,000,000,000x higher	
0 dBm	580,000 $\mu\text{W}/\text{m}^2$		
-5 dBm	180,000 $\mu\text{W}/\text{m}^2$	100,000,000x higher	
-10 dBm	58,000 $\mu\text{W}/\text{m}^2$		
-15 dBm	18,000 $\mu\text{W}/\text{m}^2$	10,000,000x higher	
-20 dBm	5,800 $\mu\text{W}/\text{m}^2$		
-25 dBm	1,800 $\mu\text{W}/\text{m}^2$	1,000,000x higher	
-30 dBm	580 $\mu\text{W}/\text{m}^2$		
-35 dBm	180 $\mu\text{W}/\text{m}^2$	100,000x higher	
-40 dBm	58 $\mu\text{W}/\text{m}^2$		
-45 dBm	18 $\mu\text{W}/\text{m}^2$	10,000x higher	
-50 dBm	5.8 $\mu\text{W}/\text{m}^2$		
-55 dBm	1.8 $\mu\text{W}/\text{m}^2$	1,000x higher	
-60 dBm	0.58 $\mu\text{W}/\text{m}^2$		
-65 dBm	0.18 $\mu\text{W}/\text{m}^2$	100x higher	
-70 dBm	0.058 $\mu\text{W}/\text{m}^2$		
-75 dBm	0.018 $\mu\text{W}/\text{m}^2$	10x higher	
-80 dBm	0.0058 $\mu\text{W}/\text{m}^2$		Land of Wireless Telecommunications Coverage (1996-TCA Preemption)
-85 dBm	0.0018 $\mu\text{W}/\text{m}^2$	5 Bars on a cell phone	
-90 dBm	0.00058 $\mu\text{W}/\text{m}^2$		
-95 dBm	0.00018 $\mu\text{W}/\text{m}^2$	1/10th lower	
-100 dBm	0.000058 $\mu\text{W}/\text{m}^2$		
-105 dBm	0.000018 $\mu\text{W}/\text{m}^2$	1/100th lower	
-110 dBm	0.0000058 $\mu\text{W}/\text{m}^2$		
-115 dBm	0.0000018 $\mu\text{W}/\text{m}^2$	1/1,000th lower	
-120 dBm	0.00000058 $\mu\text{W}/\text{m}^2$		
-125 dBm	0.00000018 $\mu\text{W}/\text{m}^2$	1/10,000th lower	

Conclusion: $0.002 \mu\text{W}/\text{m}^2$ (-85 dBm) is all the RF microwave radiation that is needed for strong cellular service in a residential neighborhood. A locality can set a maximum power output limit from all frequencies/antennas from a WTF in the public rights-of-way at **0.1 Watt of Effective Radiated Power (ERP)** because that provides -85 dBm signal strength at a 1/2-mile down the street, with five bars on a cell phone and everyone can make a call.