



Advisory

July 30th, 2020

Subject:

Building Code Requirements for 5G Cell Phone Antenna

Background:

5G is the next generation of mobile broadband that will eventually replace, or at least augment, 4G LTE connection. The antenna required for 5G equipment comes in two basic sizes and three different configurations:

1. The first is an antenna that is smaller than a 4G antenna that may be mounted with other 4G antenna on the same structure or separately on a tower or pole. The tower or pole may be installed on a building, generally on the roof or attached to an exterior wall but in a high location. These are commonly known as low-band spectrum antenna.
2. The second is when an array of 5G antenna are installed together to provide better coverage. These are generally installed on their own tower or pole. The tower or pole may be installed on a building, generally on the roof or attached to an exterior wall but in a high location. These are commonly known as mid-band spectrum antenna.
3. The third configuration is the small cell antenna that can be around 300mm square, installed low down on the exterior of a building in groups or singly and spaced closer between them than the other configurations. These are commonly known as high-band spectrum antenna or cells

The question has arisen of whether or not the building code should apply to the antenna and their installation and whether a building permit is required or not. Sentence 1.1.1.1.(5) Division A of the National Building Code – Alberta Edition, states: this code does not apply to (b) “utility towers and poles, television and radio or other communications antennas or towers, except that loads resulting from those located on or attached to a *building* shall be included in the *building design*”.

Different manufacturers of the various equipment will all have different attachment methods for the equipment therefore the manufacturers will have to provide details to the owners and contractors to properly install the equipment. The installation instructions should include the minimum requirements for the supporting structure. The attachment of the equipment is through the building envelope and therefore must be considered when doing a Building Exterior Visual Assessment (BEVA) under the City of Calgary Building Maintenance Bylaw. The bylaw applies to buildings that are five storeys or greater and over 10 years old.

As there is wiring to the antenna there are also Canadian Electrical Code and City of Calgary electrical permit requirements that must be considered.



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If the antenna is to be installed on top of or onto the side of a structure and the structure needs to be upgraded to accommodate the loads of the antenna, a building permit is required. The building permit submission must be complete with engineer stamped drawings. The design is to include the supporting method, the additional structure to be added and the method of sealing the building envelope at any penetrations.

If the Building Maintenance Bylaw applies to the subject building then this equipment must be considered when doing the Building Exterior Visual Inspection (BEVA). If attached to the roof the equipment is considered "communication equipment". If the equipment is attached to an exterior wall it should be entered as "other" in the exterior wall section of the assessment.

Wiring that is added to a buildings electrical system to provide power to 5G antenna needs to be installed by a qualified electrical contractor, the qualified electrical contractor must obtain an electrical permit for this work.

Note: This interpretation is made by the Codes and Standards Technical Interpretation Committee (CSTIC), July 30th, 2020.

Chief Building Official
Calgary Building Services
Planning & Development