

# MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,  
AND LANDSCAPE ARCHITECTS



December 11, 2023

Mr. Ryan Foltz  
Arcola Towers  
116 West Washington St, Suite 203  
Middleburg, Virginia 20117

Re: Site Name: VDOT Warrenton  
Rt 17 North Ramp  
Warrenton, Virginia 22405 (Fauquier County)  
MRA Job No. 21853.012

Dear Ryan:

The purpose of this letter is to certify that the proposed 150'-0" steel monopole structure will be designed by the manufacturer to meet the requirements of the 2018 Virginia Uniform Statewide Building Code (2018 VUSBC), ASCE 7-16, and the ANSI/TIA-222-H-2017 "Structural Standard for Antenna Supporting Structures and Antennas" Standard.

Per the TIA-222-H Standard and 2018 VUSBC requirements, the monopole shall be designed under the following minimum loading conditions:

TIA-222-H: 112 mph Wind (3-second gust) + No Ice  
TIA-222-H: 30 mph Wind (3-second gust) + 1" Radial Ice

Note: The monopole shall also be designed to resist seismic loading, if required, per TIA-222-H in conjunction with site specific soil parameters determined from a geotechnical investigation.

In addition to the minimum loading conditions above, we note that the monopole shall also be designed by the manufacturer such that should failure of the monopole occur under extreme weather conditions, the maximum "fall zone" radius will not exceed 75'-0" from the center of the monopole's base. While failure is extremely rare in any kind of tower, it is especially so for monopoles. In order to minimize damage to the surroundings below, a common industry practice is to design the monopoles such that in the rare event the monopole fails, the upper portion of the pole, which is supporting all of the proposed wind loading, would collapse onto itself and therefore minimize the "fall zone" radius and damage to the surroundings below.

Manufacturers facilitate this failure method by first designing the pole per all required code parameters noted above and ensuring that both the steel pole structure and concrete foundation are adequate to support the code required loading. Once the pole and foundation are designed per code required loadings, the manufacturer establishes the "fall point" which establishes the location that the pole would "break" under extreme loading conditions beyond code requirements. Once the "fall point" is established, the portion of the steel monopole below the "fall point" is then strengthened beyond the design parameters to ensure that the ultimate failure point is located precisely as intended. In the event of loading parameters above and beyond the design code-

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required loading, which represent the equivalent loading of a 700-year wind event, the ultimate failure method of the pole would resemble the pole folding on itself at the “fall point”.

Based on the documentation made available from the manufacturer at this time, the proposed monopole shall be designed by the manufacturer such that if failure were to occur, it would occur in the upper portion of the monopole to meet the maximum “fall zone” radius requirement previously defined.

We also note that in addition to the above, the monopole will be designed to support a maximum of four (4) wireless carriers.

Monopole design documents shall be submitted from the manufacturer as part of the Building Permit submission. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,  
MORRIS & RITCHIE ASSOCIATES, INC.



Alexander J. Leadore, P.E.  
Senior Structural Engineer