

Design Radius of Curvature Requirements for FM Antenna Support Structures

(jmr – 7/11/2008)

Radius of curvature identifies the radius on an arc, or deflected shape, which is a critical measure of flexibility for FM antenna support structures. This arc is formed when the antenna support structure is deflected due to applied external loading conditions. The arc is defined by the theoretical connection of any three points on the center line of the deflected antenna support structure. The radius of curvature requirement assumes a selection of points that will generate the smallest possible radius of curvature (maximum deflection between successive points). Points taken at approximately 5 foot increments are normally suitable for determining the minimum radius of curvature throughout the antenna array.

The purpose of the minimum radius of curvature requirement is to limit the deflection in the support structure throughout the aperture of the antenna array, thus avoiding structural damage to the FM antenna feed harness and material wear on the electrical connection contact points. ERI developed this minimum stiffness standard in the early 1980's. Installation of an ERI antenna on a support structure that fails to meet the minimum radius of curvature of 3,000 feet under service loads as defined in the current ANSI/TIA-222 standard constitutes an "improper installation" and will void the antenna's warranty. A radius of 3,000 feet represents a 0.20 inch deflection from a tangent line to a circle over a 10 foot increment [See Figure 1].

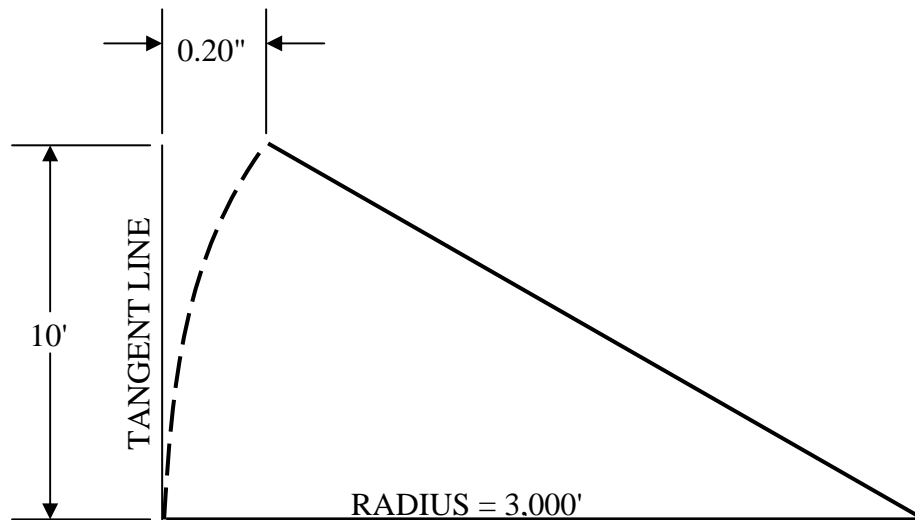


Figure 1