

1.7. ANTENNA SYSTEMS

- A. The Contractor shall furnish and install required antennas and transmission line as per their Radio System design. In addition, the Contractor shall furnish and install replacement antennas and transmission lines at all existing sites being repurposed as part of the Radio System design. The antenna systems shall comply with the following specifications:
- B. Antennas
1. Antennas shall meet or exceed the requirements of Part I of EIA-329-A. Separate transmit and receive antennas shall be provided.
 2. The Contractor shall replace ALL existing antenna mounts and associated mounting hardware with new components that meet mechanical and wind load requirements. The Contractor shall be responsible for providing structural/civil load calculations for all Tower/Building Antenna work. These calculations and drawings shall require submission of drawings for approval by SEPTA and drawings must be stamped/sealed by a Professional Engineer registered in the state of Pennsylvania. All work required to the tower/building as a result of the Contractors Antenna/Mounts/Transmission line shall be the responsibility of the Contractor. The Contractor is responsible for providing structural analysis. Should the structure(s) require an improvement; the Contractor shall design the improvement and present to SEPTA a detailed, written proposal itemized according to Contract Section XIV D.2. Changes in the Work Fixed Price Lump Sum Amount. SEPTA will negotiate a fixed price amount for compensation for this work. The amount cannot exceed the Schedule A, Allowance amount.
 3. Replacement transmit antennas shall be selected based on the expected transmitter power available at the antenna input so as to not permit the transmit ERP to exceed that on the FCC license.
 4. The Contractor shall be allowed to optimize the Radio System performance through the choice of antenna selection; however, replacement antennas shall meet the performance requirements of this section.
 5. Antennas shall offer a passive intermodulation performance with a minimum PIM rating of -150 dBc or better.
 6. Where feasible, all antennas shall be mounted so as to minimize the pattern distortion effects caused by tower members, transmission lines, other antennas, and other objects located near the antenna.
 7. Antennas shall be high-quality, ruggedized models, and designed for long-term, high-reliability performance under high wind and ice conditions, ultraviolet light exposure and for minimal generation of passive intermodulation.
 8. Antenna shall be of the highest quality and capable of surviving in and withstanding winds of up to 150 mph with no damage.
 9. Antenna selection shall consider the following characteristics:
 - a. Characteristics to minimize Time Domain Interference (TDI) in coverage overlap areas within the SEPTA coverage area.