



One of our most common engineering requirements is to determine if an existing tower is overstressed, or if an existing tower can safely accommodate additional antennas. Following are some questions we are typically asked:

Just what is a “structural analysis”? A visual inspection of a tower shows only the physical condition of a tower such as rusting, cracking or welds, bent members, etc. While a visual inspection is extremely important, it will not show whether a tower is overstressed by the loads it is supporting. A structural analysis uses mathematical engineering formulas for stress, along with known behavior of different materials under stress to determine if any one point on the tower is stressed beyond safe limits. By using state-of-the-art computer software, we can create a mathematical model of any steel structure, and quickly determine the stresses at hundreds of points on the tower.

Who determine what is a “safe load”? The Telecommunications Industries Association (TIA) has developed a written standard which provides minimum criteria for specifying and designing steel antenna towers and antenna support structures. The current standard TIA-222-G, represents years of engineering studies and has been accepted as an industry standard.

What information is required? An analysis requires all of the tower dimensions, location and type of antennas, and local climate conditions. See the reverse of this page for a listing of desired information. Information can be obtained from a combination of original tower drawings, tower records, and an on-site mapping of the tower.

What if the information is not available? Dimensions can be obtained from an on-site mapping of the tower. Ehresmann Engineering can do that for you at your request. Some assumptions may need to be made. For example, steel is generally considered to have a minimum yield strength of 36 ksi unless original manufacturer specifications are known or available to confirm actual values. Unless information otherwise, we must also consider the tower steel does not have hidden defects such as hairline cracks, internal corrosion on tube members, or excessive corrosion on anchor underground.

How do we determine climate data? The TIA standard referenced above has established a typical ice thickness and wind speed for every county in the United States. Due to the low probability that an extreme ice load will occur simultaneously with an extreme wind load, the wind load for tower design purposes is normally reduced when considered to occur simultaneously with ice. If more extreme conditions than those outlined by TIA are known to occur at a specific site and/or the owner/customer would like more conditions considered, those conditions must be specified by the owner/customer.

What is the cost of an analysis? The price varies with the size, type and complexity of the tower. Ehresmann Engineering will quote you a firm price in advance on any structure. A re-analysis of the same tower is provided at a reduced cost to consider various options in antenna loading, environmental conditions or to consider tower modifications.