# VIBRATION & FATIGUE

Although very rare, vibrations severe enough to cause damage can occasionally occur in any type of pole structure. The conditions that induce vibration are a randomly occurring phenomenon. This unpredictable course of nature requires structures to be inspected weekly for the first three months of operation. It is imperative to communicate any pole vibrations to the factory immediately.

Please keep in mind that pole structures will "sway" in the wind. There is a difference between vibrations (i.e. harmonic) and pole sway. Second mode vibrations typically manifest themselves in the middle of the pole structure instead of the top. A second mode vibration problem is detected when the middle of the pole structure is moving (side-to-side) while the top and bottom of the pole are stationary. Some people have referred to this action as a "hula-dance" type motion.

First mode harmonic vibration is harder to detect as this is movement at the top of the pole and can be confused with simple pole sway. Harmonic vibration is a cycle that repeats itself. Such as a back and forth movement that is of the same exact distance and direction from center without variation for an extended period of time. Any movement that does not repeat itself in an opposing direction from the center point is simple pole sway.

Harmonic vibration is more likely to occur when structures are installed without attaching the intended equipment (i.e. light fixtures, arms, signs, etc). Also, harmonic vibrations tend to appear more often in square non-tapered structures more so than any other structural cross-section. Regardless of tendencies to product type, materials, heights, or cross-section type, harmonic vibration occurs as a random act and is an unpredictable phenomenon.

In the event that you have detected or are suspicious of harmonic vibrations, please consult the factory immediately.

**Figure 61 - Area Lighting Pole**