Sag for Each Span Calculations

Stringing sags are derived by expanding spans within a ruling span so that tension in the sag span will be representative of that in the ruling span. Catenary equations are used to calculate stringing sags. The specific formula used is as follows :

$$D = a * COSH (B/a) - a$$

Where :H = Horizontal tension at center of span (Lbs, Kg, or N)
   W = Conductor weight (Lb/Ft, Kg/M, or N/M)
   B = l/2 span length, assume level supports (Feet or Meters)
   D = Sag (Feet or Meters)
   a = H /W (Feet or Meters), referred to as Catenary Constant

Horizontal tensions are by definition the same in all spans within a ruling span section. SAG10 calculates and stores the horizontal tension for each temperature needed in constructing a stringing chart.

3rd Return Wave Calculations

The equation used for sagging by stopwatch is derived from the following 3 equations:

$$V = sqrt(Pg / W)$$

$$D = \frac{W * S * S}{8 P}$$

$$F = S / V$$

Where :F = Time wave has traveled (Sec.) ; = T / 2C
   V = Velocity of transverse wave (Ft/Sec.)
   P = Tension (Lbs.)
   W = Weight of conductor (Lb/Ft.)
   S = Distance travelled by wave (Ft.)
   D = Sag (Ft.)
   g = 32.2 (Ft / Sec$^{2)}$

These equations are combined to form the equation for determining the wave return time:

$$T = .99689 C sqrt(D)$$

Where: T = Time for C waves to return (Sec.) ; = 2 * F * C
   C = Number of return waves

3rd Return Wave :   T = 6 * F

5th Return Wave :   T = 10 * F