Solutions #2

Dear CVG 2171 students,

Below are the solutions to the last assignment. You may contact your TA if anymore explanation is needed.

1-

Correction for length: $C_p = \left(\frac{P - P'}{P'}\right) L$ $\quad L = 582.366$ ft.

$\therefore C_l = \left(\frac{100.012 - 100.000}{100.000}\right) \times 582.366 = 0.070$ ft.

Correction for temperature: $C_t = K(T_1 - T)L$

$\therefore C_t = 0.0000065(55-68) \times 582.366 = -0.049$ ft.

Correction for Pull: $C_p = (P_1 - P)\frac{L}{AE}$

$\therefore C_p = (17-12)\frac{582.366}{0.0078 \times 29 \times 10^6} = 0.013$ ft.

Correction for sag: $C_s = -\frac{w^2 L_s^3}{24 P_1^2}$

$C_{s_1} = \frac{(0.0266)^2 \times (50)^3}{24 \times (17)^2} \times 10 = -0.128$ ft.

$C_{s_2} = -\frac{(0.0266)^2 \times \left(\frac{582.366}{2}\right)^2}{24 \times (17)^2} \times 2 = -0.014$ ft.

$\therefore C_s = -0.128 - 0.014 = -0.142$ ft

Hence, actual distance between A & B:

$AB = 582.366 + 0.070 - 0.049 + 0.013 - 0.142 = 582.258$ ft.

ANS.

2-

16.299 m:

$$C_L = \frac{29.991-30}{30}16.302 = -0.005;\ C_T = 0.0000116(25-20)16.302 = 0.0009 \text{ m}$$

$$C_P = (7.9-5.5)\frac{16.302}{0.016(2.000.000)} = 0.0012 \text{ m};$$

3-

Correction for length:

$$C_p = [(L-L')/L'] * L = [(100.008-100.00)/100.00] * 97.54 = 0.008 \text{ ft}$$

Horizontal distance to be laid out:

$$97.54-0.008 = 97.53 \text{ ft}$$

Good Luck,