Answers to "Test Yourself" No. 18

Combination Horizontal and Vertical Curve

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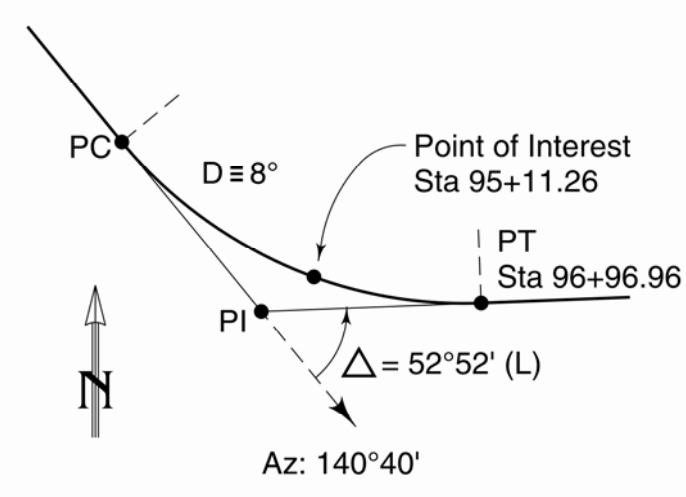
Faced with any problem, what does one do? DRAW A SKETCH!



First the horizontal curve part:

PC Sta = PT Sta – L

Since D = 8°, R = 716.197'

With f and R known, L = 660.83' (L = 2;RΔ/360°)

PC Sta = 90+36.13

Deflection angle at PC to Station 95+11.26

Defl. angle = (95+11.26 – 90+36.13) (8) / 200 (Defl. angle = l D/200)

Defl. angle = 19°00'19"

Azimuth, PC to Point = 121°39'41"

Subchord, PC to Point = 466.47 (Subchord = 2Rsin(Defl. angle))

Coordinates of PC = 9546.05 N
7446.04 E

Therefore, coordinates for Station 95+11.26: 9301.20 N
7843.08 E

Now the vertical part:

$$Elev = \frac{g_2 - g_1}{2L} x^2 + g_1 x + Elev\ BVC$$

x is the distance, in Stations, from BVC to the point, which is 3.6841

$$Elev = \frac{-3.3 - 8.7}{(2)(15)} 3.6841^2 + (8.7)\ (3.6841) + 555.55$$

Elev = 582.17