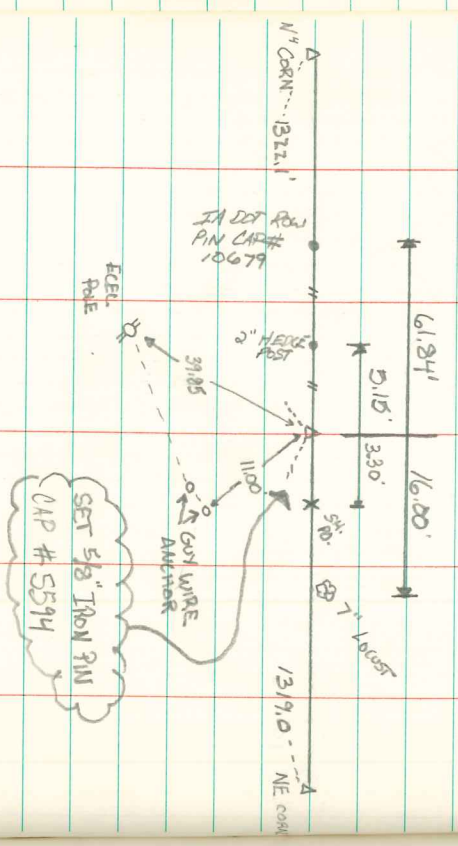


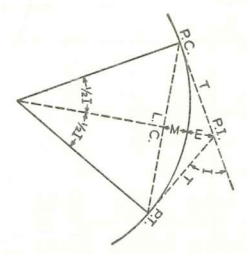
NW CORNER NE¹ NE⁴
SECTION 1-75-21



SET 1/8" IRON PIN
BY ABIE DAVIS

CURVE AND REDUCTION TABLES

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CURVE FORMULAS

1. Radius : $R = \frac{50}{\sin D/2}$
2. Degree of Curve: $D = 100 \frac{I}{L}$. Also, $\sin D/2 = \frac{50}{R}$
3. Tangent : $T = R \tan \frac{1}{2} I$. Also, $T = \frac{T \text{ for } 1^\circ \text{ curve}}{D} + C$.
4. Length of Curve: $L = 100 \frac{I}{D}$
5. Long Chord : $L, C = 2R \sin \frac{1}{2} I$.
6. Middle Ordinate: $M = R (1 - \cos \frac{1}{2} I)$
7. External : $E = \frac{R}{\cos \frac{1}{2} I} - R$. Also, $E = T \tan \frac{1}{4} I$.

EXPLANATION AND USE OF TABLES

Given P.I. Sta. 83+40.7, $I = 45^\circ 20'$ and $D = 6' 30''$ find:
 Stations—P. C. = P. I. - T. $T \text{ for } 1^\circ \text{ Curve} = \frac{T}{D}$ + C. From Tables V and VI
 $T = \frac{2392.8}{6.5} + 197 = 368.32 = 3 + 68.32$. Sta. P. C. = 83+40.7 - (3+68.32) = 79+72.38.
 P. T. = P. C. + L, and $L = 100 \frac{I}{D} = 100 \frac{45.33}{6.5} = 697.38$. Therefore, P. T. = (79+72.38) + (69+7.38) = 149+79.76.
 Offsets—Tangent offsets vary (approximately) directly with D and with the square of the distance. From Table III Tangent Offset for 100 feet = 5.669 feet. Distance = 80 - Sta. P. C. = 27.62. Hence offset = $5.66 \times \left(\frac{27.62}{100}\right)^2 = 4.32$ ft. Also, square of any distance, divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(27.62)^2 \div (2 \times 881.95) = 4.32$ ft.
 Deflections—Deflection angle = $\frac{1}{2} D$ for 100 ft, $\frac{1}{4} D$ for 50 ft, etc. For "X" ft., Deflection Angle (in minutes) = $\frac{3}{8} X \times D$. For Sta. 80 of above curve Deflection Angle = $3 \times 27.62 \times 6.3 = 53.86'$. Also Deflection Angle = diff. for 1 ft. from Table III $X \times 1.95$
 $\times 27.62 = 53.86'$. For Sta. 181 Deflection Angle = $53.86' + \frac{6' 30''}{2} = 4^\circ 8.86'$.
 External—From Table V for 1° curve, with central angle of $45^\circ 20'$, $E = 479.6$. Therefore, for $6' 30''$ curve, $E = \frac{479.6}{6.5} + \text{Correction from Table VI} = 7.378 + .039 = 7.417$.