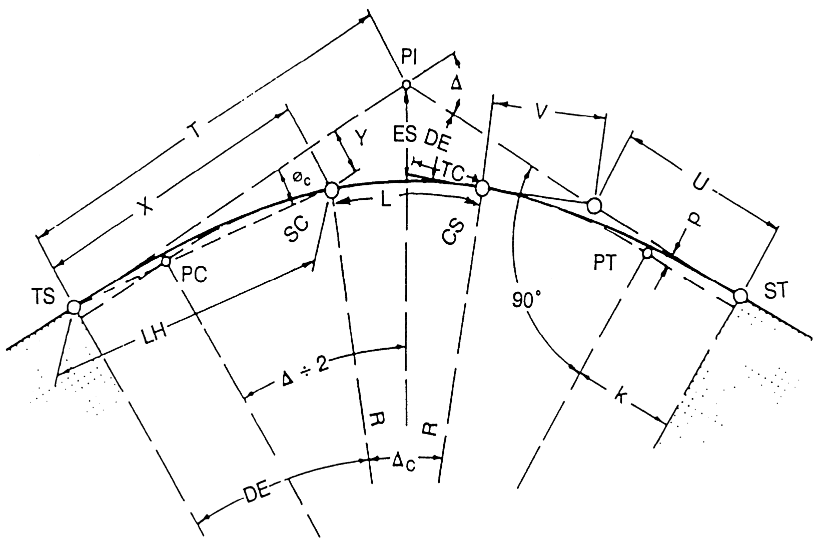
TRANSITION (SPIRAL) CURVES



LS = Length of Spiral
L = Length of Circular Curve
R = Radius of Circular Curve
TC = Tangent of Circular Curve
T = Tangent Distance
Δ = Deflection Angle Between the Tangents
DE = Spiral Angle
Δ_C = Central Angle Between the SC and CS
ES = External Distance
LH = Long Chord
U = Long Tangent

V = Short Tangent
X = Tangent Distance for SC
Y = Tangent Offset of the SC
k = Simple Curve Coordinate(Abscissa)
P = Simple Curve Coordinate(Ordinate)
$\varnothing_C$ = Deflection Angle of Spiral Curve
TS = Tangent to Spiral
SC = Spiral to Circular Curve
CS = Circular Curve to Spiral
ST = Spiral to Tangent

SPIRAL CURVE FORMULAS

DE = $(28.6479 \times LS) \div R$
Z = $0.01745 \times DE$
X = $LS \times [1 - (Z^2 \div 10) + (Z^4 \div 216)]$
Y = $LS \times [(Z \div 3) - (Z^3 \div 42) + (Z^5 \div 1320)]$
L = $(R \times \Delta_C) \div 57.2958$

TC = $R \times [\text{Tan}(\Delta_C \div 2)]$
Δ_C = $\Delta - (2 \times DE)$
p = $Y - [R \times (1 - \text{Cos } DE)]$
k = $X - [R \times (\text{Sin } DE)]$

TO CALCULATE T AND ES OF A SIMPLE CURVE WITH EQUAL SPIRALS

T = $[(R + p) \times \text{Tan}(\Delta \div 2)] + k$
ES = $[(R + p) \times \text{Exsec}(\Delta \div 2)] + p$
ES = $[(R + p) \div \text{Cos}(\Delta \div 2)] - R$

TO CALCULATE THE TANGENT DISTANCES OF A SIMPLE CURVE WITH UNEQUAL SPIRALS

Ti_{in} = $[(R + P)_2 \div \text{Sin } \Delta] - [(R + p)_1 \times \text{Cot}\Delta] + k_1$
T_{out} $[(R + p)_1 \div \text{Sin } \Delta] - [(R + p)_2 \times \text{Cot } \Delta l + k$*

FIGURE C-6-4 TRANSITION (SPIRAL) CURVES

* Rev. 1/07