SECTION 15 – HORIZONTAL CURVES

0324. Horizontal curves should be arcs of a circle (simple curves), meeting the straight which they connect tangentially. They are specified either by radius or by degree of curvature (see para 68).

On first class roads transition curves may be introduced between the ends of the simple curve and the straights. They are spiral in form, their degree of curvature increasing gradually from zero to that of the simple curve.

0325. The Simple Curve. The main components of the simple curve are illustrated in Figure 3.5 and are defined below:

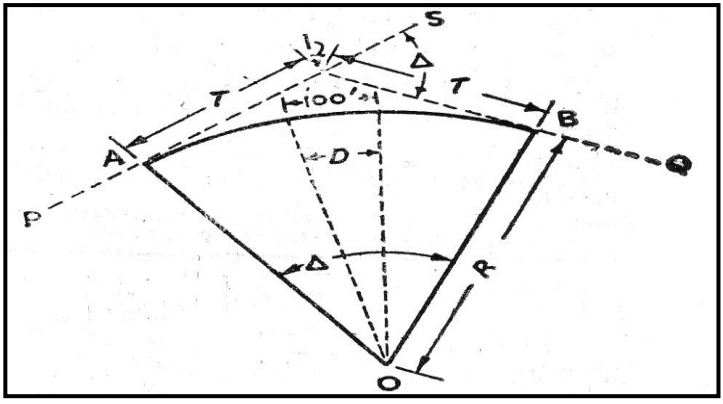

Figure 3-5: The Simple Curve

a. Simple Curve. A circular are of radius R, joining two straights (tangents), AP and BQ.

b. Tangent Point. The two points at which the curve begins and finishes (point A and B in Figure 3.5).

The start of the curve, point a, is called the TC (tangent to curve).
The end of the curve, point B, is called the CT (curve to tangent).

c. Degree Of Curvature (D)- The angle subtended at the center (0) by a chord of 100 ft (NOT by an arc of 100 ft).

d. Intersection point (IP). The point (1) at which the tangents would intersect if produced.

e. Intersection angle (△). The angle of deviation between the tangents (angle SIB).

f. Tangent length (T). The distance from the intersection point to either tangent point (IA and IB).

g. Central angle (△). The angle at the center included between the radii which pass through the tangent points (angle AOB). It is equal to intersection angle.

0326. Ideally, the minimum radius of a curve is governed by the requirements of sight distance, but standards adopted will vary with the nature of the country, the type of road and the class of traffic. The absolute minimum is the turning of the vehicles using the road.

0327. Normal standards for military roads are given in Table 3.11. Increase of road width on curves is specified in Table 3.4. Methods of setting out simple curves are described in section 63.

TABLE 3.11 – MINIMUM RADIUS OF HORIZONTAL CURVES FOR MILITARY ROADS

Type of country	Tactical roads		Strategic roads	Corner curves at junctions (ft)
	General purpose (ft)	Jeep tracks (ft)		
(a)	(b)	(c)	(d)	(e)
Normal	300	150	500	35
Mountainous	60 to 100	60	100	-

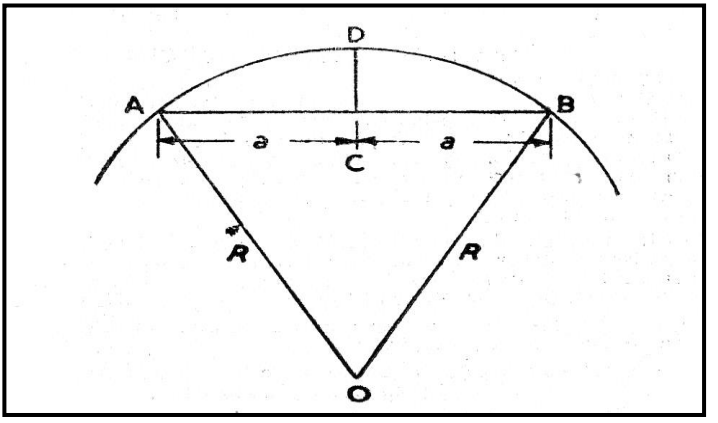

Figure 3-6: Method of Measuring the Radius of an Existing Curve.

0328. To find the radius of an existing curve:

Set out a chord AB and bisect it at C (see Figure 3.5), so that AC=BC=a. From point C measure the perpendicular offset (x) to point D on the curve. The radius, $R=(\frac{x^2 + a^2}{2x})$ It is often convention o make the chord length 60 ft (see para 62). Values of R for various values of the offset (x) from a 60 ft chord are given in Table 3.12.

TABLE 3.12 – RADIUS OF A CURVE RELATED TO THE OFFSET FROM A 60 FT CHORD

Offset (x)		Radius (R) (ft)	Offset (x)		Radius (R) (ft)
Ft	Ins		ft	Ins	
(a)	(b)	(c)	(d)	(e)	(f)
-	3	1,800	3	6	130
-	6	900	4	-	114
-	9	600	5	-	93
1	-	450	6	-	78
1	3	360	8	-	60
1	6	300	10	-	50
1	9	258	12	-	44
2	-	226	16	-	36
2	6	181	20	-	32
3	-	151	25	-	30