## Compound circular curves

There are three basic types of circular curve: *simple* curves, *compound curves* and *reverse Curves*, all of which can be referred to either **as** *radius* curves or *degree* curves.

These consist of two or more consecutive simple circular curves of different radii without any intervening straight section. A typical two-curve compound curve is shown in Figure 12.2, where a curve of radius *R1* joins a curve of radius *R2*. The object of such curves is to avoid certain points, the crossing of which would involve great expense and which cannot be avoided by a simple circular curve.

Nowadays they are uncommon since there is a change in the radial force (as defined in Section 13.1) at the *common* tangent *point* Tc where one curve meets another, as shown in Figure 12.2. The effect of this, if the change is marked, can be to give a definite jerk to the passengers particularly in trains. To overcome this problem, either *very large radii* should be used to minimise the forces involved or *transition.*

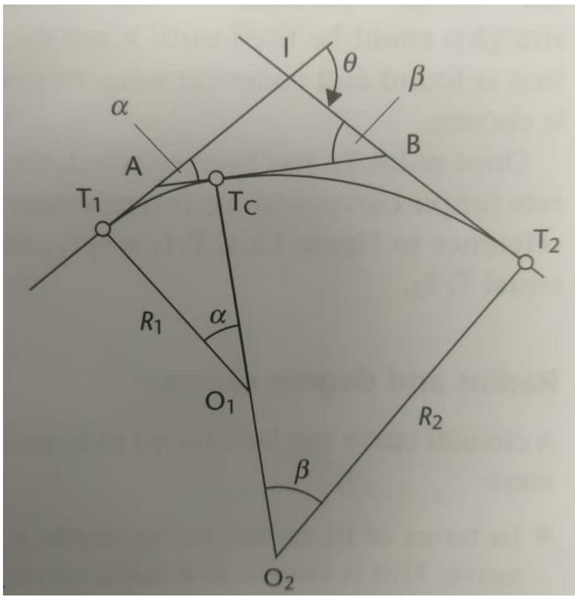


Figure 12.2 – Compound curve

If a compound curve such as that shown in Figure 12.2 is being considered then the best approach is to treat it as if it were two consecutive simple circular curves, that is, T1T and TCT2. This is done by introducing a *common tangent line* AB, which passes through the common tangent point *Tc*. This creates angles a and B, which are the

Reference: Surveying for Engineers, 5th edition (John Uren and Bill Price) deflection angles for the simple circular curves TTC and TT2, respectively, where (a + *B*) = *0.* Having established a and 6, the radii of curvature R1 and *R2* can be chosen and the curves designed as described in Section 12.4. With reference to Figure 12.2, T1A ATC and TCB = BT2 but ATC does not equal TċB.

Reference: Surveying for Engineers, 5th edition (John Uren and Bill Price)