Setting Out Using Coordinate Method

Two traditional methods of establishing the centre lines of composite and wholly transitional curves have been described. Although these methods are still used, they have been virtually superseded for all major curves by coordinate methods that use control networks. In such methods, which are equally applicable to transition curves and circular curves, the coordinates of points at regular intervals along the centre line are calculated with reference to a site control network.

The points are then pegged out on site either using a total station set at points in the ground control network surrounding the scheme as shown in figure 13.19 or by using a GNSS receiver. In both cases the coordinates of points to be fixed on the centre line and the coordinates of the control network being used must be based on the same site coordinate system.
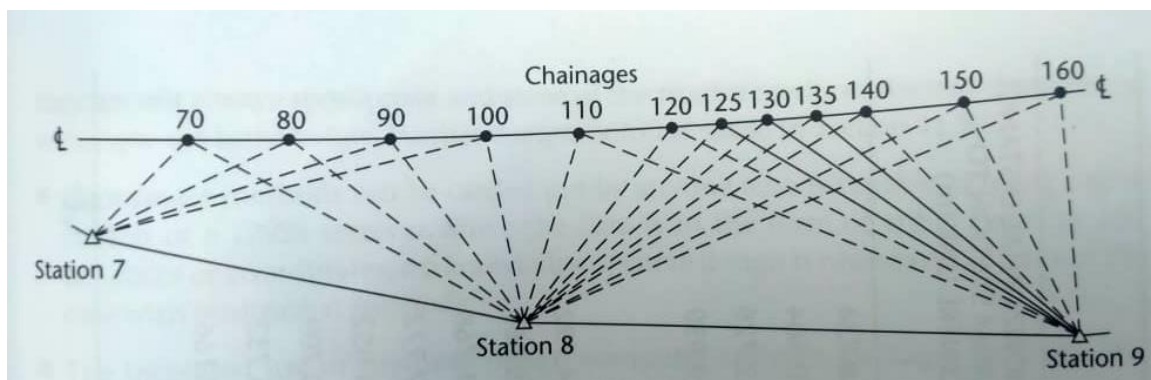

Figure 13.19

Nowadays, the coordinate calculations involved are usually done within computer software highway design packages and results of such computations are normally presented in the form of computer printouts ready for immediate setting out use on site.

The curve is to be set out by bearing and distance from control points 7, 8 and 9 with a total station, each centre line point being established from one control point and checked from another. The calculations required to produce as follows;

-The coordinates of the control points are found from the control survey data.

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

-The horizontal alignment is designed and the coordinates of the intersection and tangent points are calculated.

- Assuming that the centre line is to be pegged at exact multiples of through chainage, chord lengths and tangential angles are calculated for the entry and exit transition curves and the central circular arc.

- The coordinates of the points to established on the centre line are calculated using the chord lengths, tangential angles and the coordinates of the intersection and tangent points.

-Control points which are visible from and which will give a good intersection to the proposed centre line are found and the bearings/ distances are calculated from the control points to the centre line points.

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