

A combination of horizontal and vertical curvature at a summit should be avoided. It is highly desirable for safety reasons to arrange groups of curves in orderly sequence from flat to sharp and back to flat, using the easiest possible curves at the ends of long tangents. Curvature should not be misleading to motorists by sudden variation of degree. At all times, the flattest curvature practical should be used.

On all location surveys, simple curves shall be located with sufficient distance between the P.T. of one curve and the P.C. of the next to permit the use of standard length transition spirals. Where it is impossible to meet this requirement, curves should be compounded or reversed and made as near the same degree as practicable.

For small angles, the curve must always be of sufficient length to avoid the appearance of a kink in the alignment.

When it is necessary to introduce curvature on the approach to a bridge, the P.C. or P.T. of such curves shall be located, if possible, so that the standard length transition spiral will not overlap the structure. If this is impossible, then consideration should be given to putting the structure entirely on the circular part of the curve.

Sec. 4.06 **Field Data**

All field data will be secured by GPS RTK, Mobile scanning, Robotic total station, or Total Station Survey methods and processed in accordance with the procedures outlined in this manual. This information should be complete and will be used to prepare finished plan base.

Sec. 4.07 **Topography**

Topography will be secured by the use of Total Survey Station, mobile scanning, and/ or Photogrammetric methods and procedures. The procedures and standards for creating Survey CADD files are explained in **Chapter 2** of the CADD manual. The Survey CADD Section has made a conscious effort in creating unique cells, levels, and linestyles for topography and utilities that may be encountered by a survey party or consultant staff. Examples of these cells and linestyles are also included in **Appendix A** of the CADD manual. It is required that these levels, cells and linestyles be used in all VDOT survey files. [◇]

Topography (General)

The location of edges of pavement, shrubbery, walls, curbs, fire hydrants, water meters, right-of-way monuments and project markers shall be shown. Fences, streams, woods, outlet ditches, entrances, roads, bridges, culverts, pipes, end walls, et cetera will also be shown. Existing pipe sizes should be accurately measured.

The sizes of trees will be measured **4.5 feet** above the ground, or Diameter at Breast Height (DBH), to obtain the diameter of the tree. Isolated or cultivated trees should be located and described.

[◇] March 3, 2014