CVG4150

Tutorial 2

Q1.

A simple highway curve is planned to connect two horizontal tangents that intersect at sta. 2500 + 00.00 at an external angle of 52° . For a design speed of 60 mi/h and a curve radius of about 1.25 times the minimum allowable, calculate (a) the design rate of superelevation and (b) the required length of superelevation runoff. Assume a four-lane undivided highway and 10-ft lanes. Clearly state any assumptions that you think are needed.

Design Speed MPh

rate, *e*	20	30	40	50	55	60	65	70
				12-ft lanes				
0.02	50	100	125	150	160	175	190	200
0.04	60	100	125	150	160	175	190	200
0.06	95	110	125	150	160	175	190	200
0.08	125	145	170	190	205	215	230	240
0.10	160	180	210	240	255	270	290	300
0.12	195	215	250	290	305	320	350	360
				10-ft lanes				
0.02	50	100	125	150	160	175	190	200
0.04	50	100	125	150	160	175	190	200
0.06	80	100	125	150	160	175	190	200
0.08	105	120	140	160	170	180	190	200
0.10	130	150	175	200	215	225	240	250
0.12	160	180	210	240	255	270	290	300

Source: (From *A Policy on Geometric Design of Highways and Streets,* Copyright 1990, by the American Association of State Highway and Transportation Officials, Washington, DC [2.2] (Table III-15, p. 178.)

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Q2.

Sketch the plan view and the longitudinal profile of your curve design assuming a normal crown of 0.02 ft/ft and pavement rotation about the centreline.

Q3.

A 2000-ft vertical curve connects a +3% grade to a -5% grade. If the vertical tangents intersect at sta. 52 + 60.55 and elevation 877.62 ft, calculate the elevation at the VPC, VPT, high point and sta. 54 + 00.