

Inter-Departmental Memorandum

Date: November 24, 2008
To: Design Teams
From: Keith Purvis
Roadway Design Division Engineer
Subject: Superelevation

The procedure for determining superelevation (SE) rates and runoff lengths was changed in the 2004 edition of the *AASHTO Policy on Geometric Design of Highways and Streets* ("The Green Book"). The SE tables are now based on the radius of the curve rather than the degree of curvature. The values derived from the Tables result in conservative SE rates that are rounded up to the nearest 2/10ths of a percent (interpolation is no longer required).

Each SE rate for a given design speed now has a unique SE runoff length. In the past a range of SE rates for a given design speed had the same runoff length. SE runoff lengths are provided in a separate table.

Roadway Design Division has revised the Standard Drawings to reflect these changes. In addition to revising the existing eight (8) SE standard drawings, two (2) additional sheets will be added. The two (2) added sheets (SDRO-1 & 2) contain the SE runoff lengths. In the interim before revised Standard Drawings are issued, the SE sheets will become Special Design Sheets. Copies of the sheets are attached. Electronic copies of the sheets can be obtained from Steve Reeves of Roadway Design or <http://rwdweb>.

An example of the use of the new tables is also attached.

New GeoPak superelevation preference files have been created which allows GeoPak to calculate superelevation using this new method. These will be made available in December with a CADD update. After this update is installed GeoPak will be able to look at either the old or new preference files to determine the SE rate and runoff length. The new preference file names will begin with 09. Once this policy goes into effect, and until all old projects are completed, designers must take care while using Geopak to select the correct table.

When setting a horizontal alignment, designers will still select curves by the degree.

All new projects will be designed using the new tables. Existing design projects will be evaluated individually to determine which table to use.

In addition to the changes described above, two SE standard drawings will be eliminated. All normal sub-grade slopes are now 2%. Therefore, Standard Drawings SE-2B (277) and SE-2D (279), SE Transition Cases I & II with 3% sub-grade, will no longer be used.

Attachments

CKP/JMR

pc: Roadway Design Section Engineers
Roadway Design Division (S. Reeves)
Roadway Design Division (K. Boteler)
Bridge Engineer
Chief Engineer
Assistant Chief Engineer, Pre-Construction
Assistant Chief Engineer, Operations
District Engineers
State Aid Engineer
Active Consultants
file

MINIMUM RADII FOR DESIGN SUPERELEVATION RATES, DESIGN SPEEDS, AND $e_{max} = 0.100$									
e	V = 30 mph	V = 35 mph	V = 40 mph	V = 45 mph	V = 50 mph	V = 55 mph	V = 60 mph	V = 65 mph	V = 70 mph
	R (ft)	R (ft)	R (ft)						
0.020	2440	3210	4080	5050	6130	7330	8630	9720	10900
0.022	2200	2900	3680	4570	5540	6630	7810	8800	9860
0.024	2000	2640	3350	4160	5050	6050	7130	8040	9010
0.026	1840	2420	3080	3820	4640	5550	6550	7390	8290
0.028	1690	2230	2840	3520	4280	5130	6050	6840	7680
0.030	1570	2060	2630	3270	3970	4760	5620	6360	7140
0.032	1450	1920	2450	3040	3700	4440	5250	5930	6680
0.034	1360	1790	2290	2850	3470	4160	4910	5560	6260
0.036	1270	1680	2150	2670	3250	3900	4620	5230	5900
0.038	1190	1580	2020	2510	3060	3680	4350	4940	5570
0.040	1120	1490	1900	2370	2890	3470	4110	4670	5270
0.042	1060	1400	1800	2240	2740	3290	3900	4430	5010
0.044	994	1330	1700	2120	2590	3120	3700	4210	4760
0.046	940	1260	1610	2020	2460	2970	3520	4010	4540
0.048	890	1190	1530	1920	2340	2830	3360	3830	4340
0.050	844	1130	1460	1830	2240	2700	3200	3660	4150
0.052	802	1080	1390	1740	2130	2580	3060	3500	3980
0.054	762	1030	1330	1660	2040	2460	2930	3360	3820
0.056	724	974	1270	1590	1950	2360	2810	3220	3670
0.058	689	929	1210	1520	1870	2260	2700	3090	3530
0.060	656	886	1160	1460	1790	2170	2590	2980	3400
0.062	624	846	1110	1400	1720	2090	2490	2870	3280
0.064	594	808	1060	1340	1650	2010	2400	2760	3160
0.066	564	772	1020	1290	1590	1930	2310	2670	3060
0.068	536	737	971	1230	1530	1860	2230	2570	2960
0.070	509	704	931	1190	1470	1790	2150	2490	2860
0.072	483	671	892	1140	1410	1730	2070	2410	2770
0.074	460	641	855	1100	1360	1670	2000	2330	2680
0.076	437	612	820	1050	1310	1610	1940	2250	2600
0.078	416	585	786	1010	1260	1550	1870	2180	2530
0.080	396	558	754	968	1220	1500	1810	2120	2450
0.082	377	533	722	930	1170	1440	1750	2050	2380
0.084	359	509	692	893	1130	1390	1690	1990	2320
0.086	341	486	662	856	1080	1340	1630	1930	2250
0.088	324	463	633	820	1040	1290	1570	1870	2190
0.090	307	440	604	784	992	1240	1520	1810	2130
0.092	291	418	574	748	948	1190	1460	1740	2060
0.094	274	395	545	710	903	1130	1390	1670	1990
0.096	256	370	513	671	854	1080	1320	1600	1910
0.098	236	343	477	625	798	1010	1250	1510	1820
$e_{max} = 0.100$	$R_{min} = 200$	$R_{min} = 292$	$R_{min} = 410$	$R_{min} = 540$	$R_{min} = 694$	$R_{min} = 877$	$R_{min} = 1090$	$R_{min} = 1340$	$R_{min} = 1630$

EXAMPLE

D = 1 deg 45 min

V = 65 mph

$e_{max} = 0.100$

Find e

$$R = 5729.58 / D$$

$$R = 5729.58 / 1.75$$

$$R = 3274'$$

In the 65 mph column, start at the top and go down until you get to a radius equal to, or slightly smaller than, the radius of the curve. Use the corresponding value for e.

The first radius in the 65 mph column smaller than 3274' is 3220'. Reading the value for e to the left in the table: **e = 0.056 ft / ft**

Note: Interpolation is not required