January 2, 2004

INSTRUCTIONAL BULLETIN NO. 2003-11

SUBJECT: Longitudinal Gradient (LG%)
EFFECTIVE DATE: December 31, 2003
RE: Highway Design Manual - Chapter 11.3 (Superelevation Development)
SUPERSEDES: None

The roadway design criteria used for superelevation has been revised to allow for a variance of the Longitudinal Gradient (LG). See the attached chart entitled "Application of e_{max} and Relative Longitudinal Gradients".

In the past, a longitudinal gradient (LG%) of 0.5% was used for calculating superelevation per standard drawing 100-6. This rate now may vary from 0.5% up to 0.74% with 0.5% being typical, but determined on a case-by-case basis.

To avoid errors and/or misunderstanding by field personnel and contractors in reading right of way and construction plans, include "LG%" with the curve data. Examples are shown below. The LG% will have to be provided for each end of a horizontal curve; therefore, the LG% on the PC end will be noted as PC - LG% and on the PT end as PT - LG%. The example shown for "Curve 1" is for curves with a known longitudinal gradient. The example shown for "Curve 2" is for curves retaining the existing longitudinal gradient.

The Department's standard practice is to continue to use 0.5% on all curves; however, when circumstances require the superelevation to return to a normal section in a shorter distance, the designer may use the above referenced chart to increase the rate of the Longitudinal Gradient. If necessary, the longitudinal Gradient may be different at each end of a horizontal curve. It is highly recommended that the LG% on all horizontal curves be the same, but the LG% may vary from curve to curve on a single alignment. Varying the LG% from curve to curve; however, should only be done under extenuating circumstances.

CURVE 1	CURVE 2
PI = 1384+60.02	PI = 1406+47.58
Δ = 7°02′11"(RT)	Δ = 6°42′42"(RT)
D = 2°00′00	D = 2°00′00"
R = 3000′	R = 3000′
T = 176.13′	T = 167.98′
L = 351.82′	L = 335.58′
E = 5.41′	E = 4.92′
D.S. = 45 M.P.H.	D.S. = 45 M.P.H.
eMAX. = 0.040 TABLE	eMAX. = Retain existing
e = RC	e = Retain existing
PC - LG% = 0.62%	PC - LG% = Retain existing
PT - LG% = 0.62%	PT - LG% = Retain existing

Approved: _____

E. S. Eargle
Road Design Engineer

ESE:afg

Attachment

cc:

Mark C. Lester, Prog. Dev. West	CRM East
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Doug McClure, Bridge Design Engr.	Al Barwick, CRM Manager
Clem Watson, Director of CRM Operations	Jim Frick, Contract Document Facilitator