



**NOTES:**

THE FOLLOWING EQUATIONS ARE FOR PARABOLIC, VERTICAL CURVES. THE GRADES  $g_1$  AND  $g_2$  MUST BE USED WITH THEIR ALGEBRAIC SIGNS (+ OR -). IF  $g_1$  AND  $g_2$  ARE EXPRESSED AS PERCENTAGES, L AND X MUST BE EXPRESSED IN STATIONS. IF  $g_1$  AND  $g_2$  ARE EXPRESSED AS FEET PER FOOT, L AND X MUST BE EXPRESSED IN FEET. THE SYMBOLS ARE DEFINED BY THE ABOVE DIAGRAMS.

$$A = g_1 - g_2 \quad G = g_1 - g_2 \quad e = LG/8 \quad y = 4e(X/L)^2 = (A/sL)X^2$$

THE EQUATION BELOW PROVIDES THE LOCATION,  $X_T$ , OF THE CURVE TURNING POINT WHICH IS THE HIGH POINT OR LOW POINT ON THE CURVE. THIS EQUATION IS ONLY APPLICABLE WHEN  $g_1$  AND  $g_2$  ARE NOT OF THE SAME SIGN, ALGEBRAICALLY.

$$X_T = (g_1 L) / (g_1 - g_2)$$

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REV NO.	DATE	BY	APPR	PUBLIC WORKS - STREETS AND TRANSPORTATION
1	8/04	RAW	MHA	
2	3/06	RAW	MHA	
3	2/07	RAW	MHA	
4	8/08	RAW	MHA	
5	7/14	RAW	MHA	
6	9/21	RAW	MHA	

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VERTICAL CURVE RELATIONSHIPS	STANDARD PLAN NUMBER T04-02
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