



**MaineDOT**

**ENGINEERING INSTRUCTION**

Title: Maximum Gradient	Number: C5
Discipline: General Engineering – Controlling Criteria	Issue Date: November 12, 2015
Originator: Steve Bodge, P.E	Revised Date: January 17, 2019
Approved By: Joyce Taylor, P.E., Chief Engineer	

**Background:**

The inability to meet either a maximum or minimum gradient value may produce operational or safety problems. Grade affects vehicle speed and vehicle control, particularly for large trucks. Minimum grades to achieve proper drainage have also been established.

The topography of the land traversed has an influence on the vertical alignment of roads and streets. Topography is generally separated into three classifications according to terrain - level, rolling, and mountainous.

The nature of the highway is defined as whether the roadway is Rural or Urban.

**Applicability:**

This Engineering Instruction applies to all design projects.

**Engineering Instruction:**

The Department has adopted Rolling Terrain for the majority of projects in Maine. The maximum grade allowable will be determined based on the Corridor Priority and the Nature of the highway. The minimum grade allowable will be 0.30 percent for curbed sections and 0.0 percent for open drainage sections. Where these mild grades are used for significant lengths of highway, care shall be taken to assure the combination of cross slope, grade, and special ditching are sufficient for good drainage.

The basic design criteria for Grade are based upon the information contained in Chapters 3, 5, 6, 7, and 8 of the AASHTO publication *A Policy on Geometric Design of Highways and Streets* (the Green Book). Additional guidance contained in the Green Book will also be used to determine other grade related requirements.

Corridor Priority Level	Maximum Gradient	
	Urban	Rural
Freeways	4	4
1-2	8	5
3-4	10	8
5	10	9
6	14	10

**Responsibility:**

Program Managers