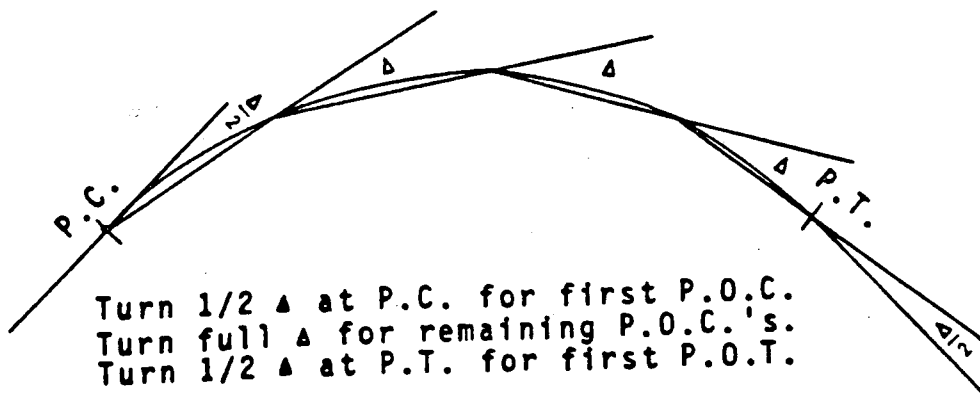


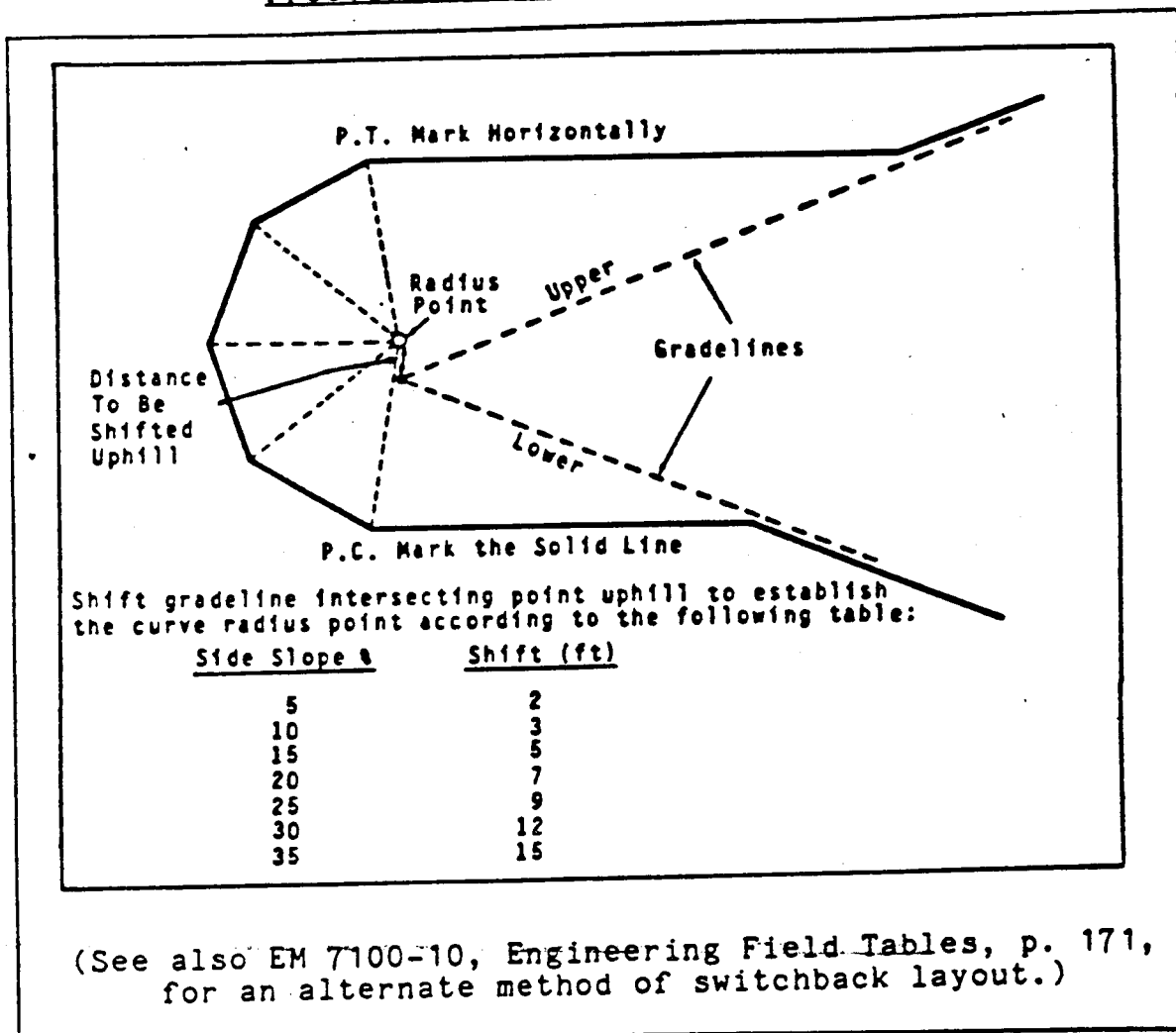
ROAD PRECONSTRUCTION HANDBOOK

Exhibit 1Deflection Angle (d) for Various Radii for
Establishing Horizontal Curves for Road Location

Radius	25 ft. Chords		50 ft. Chords	
	1/2d	d	1/2d	d
40	18°	36°		
45	16°	32°		
50	14°	29°		
55	13°	26°		
60	12°	24°		
65	11°	22°	22°	44°
70	10°	20°	20°	41°
80	9°	18°	18°	36°
90	8°	16°	16°	32°
100	7°	14°	14°	29°
120	6°	12°	12°	24°
140	5°	10°	10°	20°
160	4°	9°	9°	18°
180	4°	8°	8°	16°
200	4°	7°	7°	14°
250	3°	6°	6°	11°
300	2°	5°	5°	10°
400	2°	4°	4°	7°



ROAD PRECONSTRUCTION HANDBOOK

Exhibit 2Procedure for Locating Switchbacks

ROAD PRECONSTRUCTION HANDBOOK

Exhibit 3Locating and Carrying Grade Through a Narrow Ridge