

## CHAPTER 3

### BASE COURSE

3-1. General. Only good-quality materials should be used in base courses of heavy-duty flexible pavements.

3-2. Base course compaction. Base courses must be compacted to the maximum degree practicable. Maximum compaction will generally be to 100 percent or more of maximum density, determined in accordance with Method 100 of MIL-STD-621 using CE 55 compaction effort, hereafter referred to as a percent of maximum density.

a. Materials with design CBR values of 20 and above.

(1) Base courses. The maximum density that can be obtained is generally in excess of 100 percent of maximum density.

(2) Subbases and subgrades. Normally, density will be 100 percent of maximum density, except where it is known that a higher density can be obtained practicably, in which case the higher density should be required.

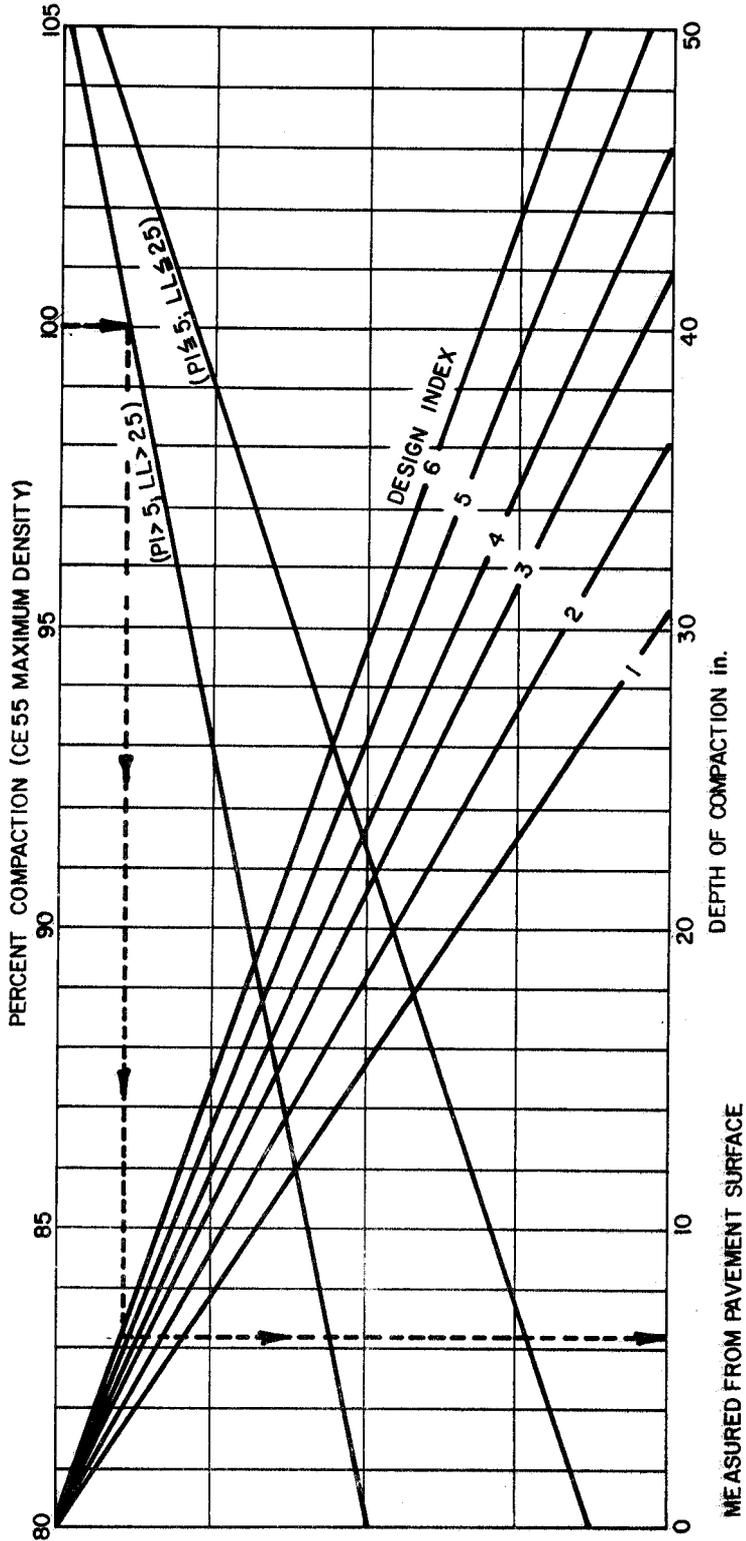
b. Materials with design CBR values below 20.

(1) Select material and subgrade in fills. Density will be as shown in figure 3-1 except that in no case will cohesionless fill be placed at less than 95 percent, nor cohesive fill at less than 90 percent.

(2) Subgrade in cuts. Subgrade must have natural densities equal to or greater than the values shown in figure 3-1. Where such is not the case, the subgrade must either (a) be compacted from the surface to meet the densities shown; or (b) be removed and replaced, in which case the requirements given above for fills apply; or (c) be covered with sufficient select material subbase and base so that the uncompacted subgrade is at a depth where the in-place densities are satisfactory.

3-3. Design CBR of base course. The design CBR of the base course will be assigned in accordance with EM 1110-3-141 with the following addition: Where subbase material is used for base construction, the CBR will be at least 50 and the material must conform to the requirements for 50-CBR subbase as shown in table 2-1.

3-4. Minimum base course thickness. The minimum allowable thickness of the base course will be as shown in table 3-1, except that in no case will the total thickness of pavement plus base for B and D roads and streets be less than 6 inches nor less than frost design minimum specified in EM 1110-3-138 when frost conditions are controlling.



U. S. Army Corps of Engineers

FIGURE 3-1. DEPTH OF COMPACTION FOR SELECT MATERIALS AND SUBGRADES OF CONVENTIONAL FLEXIBLE PAVEMENTS

Table 3-1. Minimum Thickness of Pavement and Base for Conventional Pavements

Design Index	Minimum Base Course CBR											
	100			80			50a					
	Pavement In.	Base In.	Total In.	Pavement In.	Base In.	Total In.	Pavement In.	Base In.	Total In.			
1	Stb	4	4-1/2c	MSTd	4	4-1/2c	2	4	6			
2	MSTd	4	5c	1-1/2	4	5-1/2c	2-1/2	4	6-1/2			
3	1-1/2	4	5-1/2c	1-1/2	4	5-1/2c	2-1/2	4	6-1/2			
4	1-1/2	4	5-1/2c	2	4	6	3	4	7			
5	2	4	6	2-1/2	4	6-1/2	3-1/2	4	7-1/2			
6	2-1/2	4	6-1/2	3	4	7	4	4	8			

<sup>a</sup>In general 50-CBR base course will only be used for Class E roads and streets.

<sup>b</sup>Bituminous surface treatment (spray application).

<sup>c</sup>Minimum total thickness of pavement plus base for Classes B and D roads and streets will be 6 inches.

<sup>d</sup>Multiple bituminous surface treatment (spray application).

U. S. Army Corps of Engineers

EM 1110-3-131  
9 Apr 84

3-5. Stabilization or modification. Stabilization or modification of base courses may be accomplished according to procedures in EM 1110-3-137.