

## CHAPTER 5

### DESIGN PROCEDURE

#### 5-1. General.

Once the floor-slab design requirements have been established, i.e., the type of loadings, including wall loads and both stationary live and moving live loads, the requirements are translated into meaningful design data. These design data are then compared with the existing condition data, and a floor slab design is evolved. The design procedure covers subgrade conditions, steel reinforcing, and various details such as jointing.

#### 5-2. Floor slab loads.

*a. Traffic loadings.* In order to satisfy requirements of different types of vehicles and traffic volumes, all Category I, II, and III traffic has been expressed in terms of equivalent operations of a basic axle loading. The basic loading was assumed to be an 1 8,000-pound single-axle load with two sets of dual wheels spaced 58-1/2 inches apart with 13-1/2 inches between dual wheels. It should be noted that the basic loading was arbitrarily selected to provide a reasonable spread in the loadings and traffic volumes likely to be encountered under normal conditions. A design index (DI) was devised

which expresses varying axle loads and traffic volume in terms of relative severity. The DI ranges from 1 to 10 with the higher number indicating a more severe design requirement. The basic loading described above was used to assign and rank the DI's. More information concerning the DI can be found in TM 5-822-6/AFM 88-7, Chap. 1. Table 5-1 shows the DI's for various traffic volumes. Thickness requirements for floor slabs which contain only temperature reinforcement for the ten DI's are shown in figure 5-1. The floor-slab thickness requirements are a function of concrete strength and subgrade modulus and DI. Larger forklifts having axle loads greater than 25 kips are treated separately. The required slab thickness for pavements designed for these loads are not significantly affected by vehicles having axle loads less than 25 kips (trucks, cars, buses, and small forklifts). These light loads are therefore ignored in determining requirements for pavements carrying axle loads greater than 25 kips. The thickness requirements for these loads are shown in figure 5-2.

*Table 5-1. Traffic categories for design index*

Maximum Operations Per Day Over 25 Years	Load	Design Index
50	10-kip axle-load forklift truck	4
250	10-kip axle-load forklift truck	5
10	15-kip axle-load forklift truck	
250	10-kip axle-load forklift truck	7
100	15-kip axle-load forklift truck	
250	15-kip axle-load forklift truck	8
5	25-kip axle-load forklift truck	

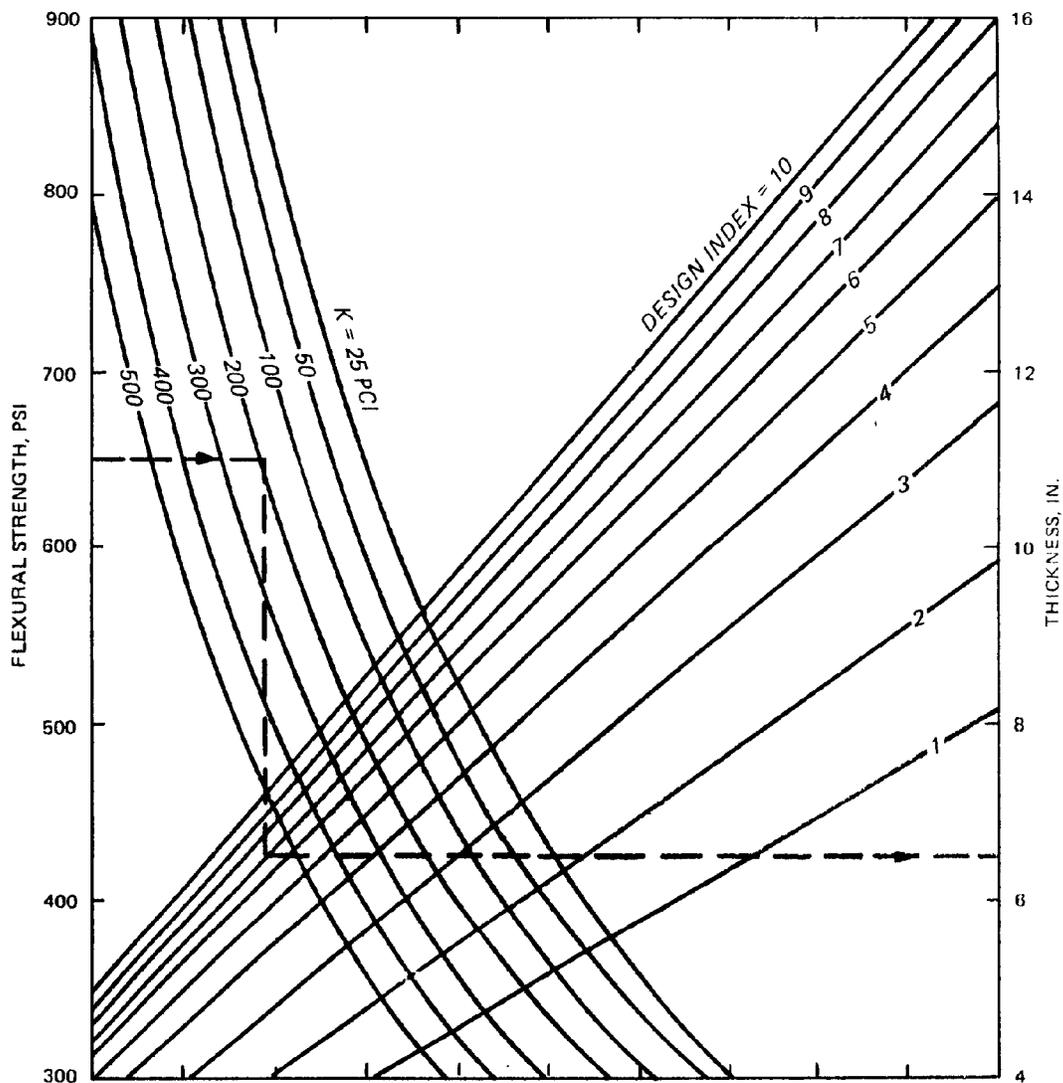


Figure 5-1. Design curves for concrete floor slabs by design index.

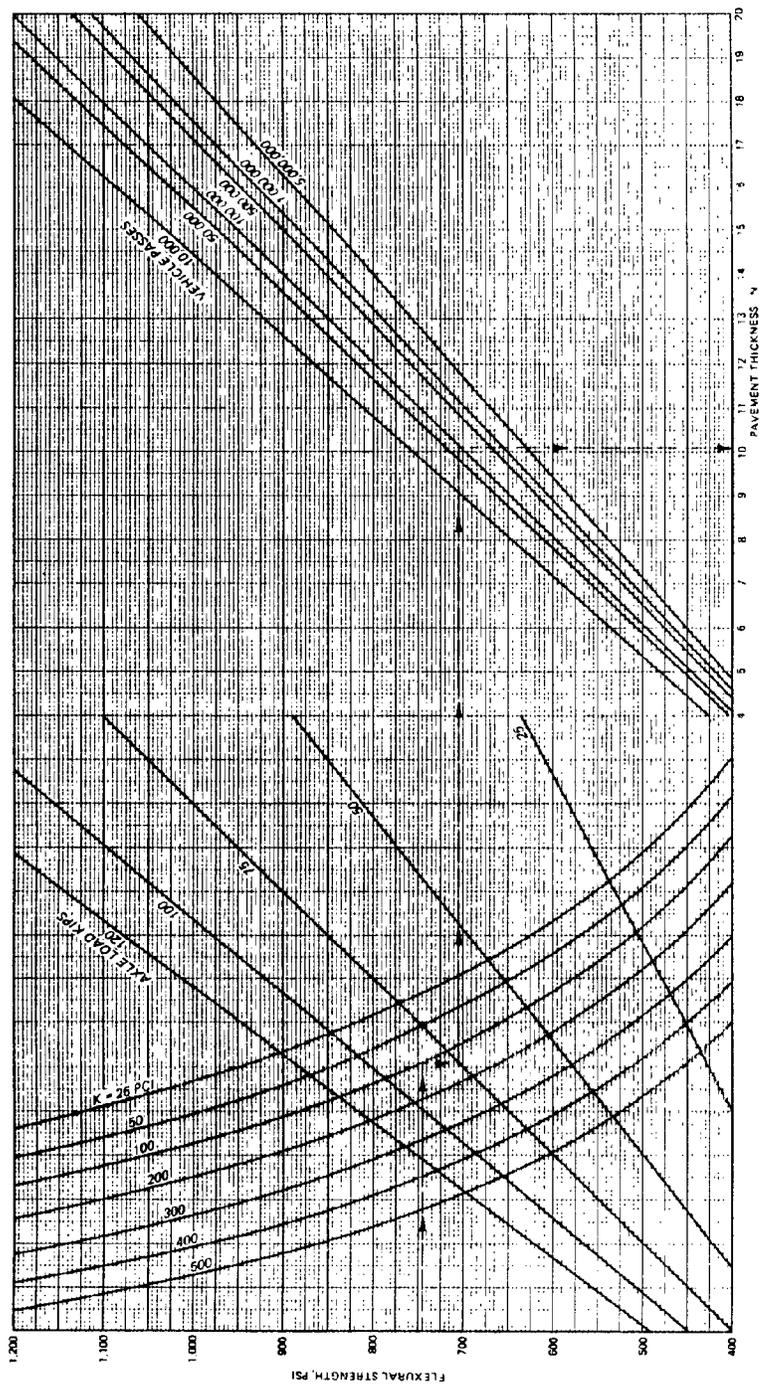


Figure 5-2. Design curves for concrete floor slabs for heavy forklifts.