Table 600.04
Reliability Parameters

Roadway Classification	*Level of Reliability, R R*	*Standard Normal Deviate, Z_R*
Truck Route	99.9	-3.090
Rural/Urban	99.9	-3.090
Expressway	99.9	-3.090
Main Road	99.0	-2.327
Sector Road	95.0	-1.645

Step 5: Select design serviceability loss, ΔPSI

The pavement serviceability is a general measure of the pavements ability to service the traffic which must pass over it. Serviceability ranges from 0 (impassable) to 5 (ideal), and represents a quantification of subjective impressions about the roadway quality. Note that a low serviceability implies only that the road has become difficult to travel over, and provides no information about the failure mode (e.g. rutting, stripping, cracking) that has created the low serviceability. The design serviceability loss (ΔPSI) is the allowable change from the initial serviceability (p_o) to the terminal serviceability at the end of the design period (p_t). The design serviceability loss is obtained by simply subtracting the final value from the initial value, and so describes the amount of degradation of service which is acceptable during the design lifetime. Recommended values for the different roadway classifications are shown in Table 600.05.

Table 600.05
Serviceability Parameters

Roadway Classification	*Initial po*	*Terminal pt*	*Design Serviceability Loss, ΔPSI*
Truck Route	4.2	3.0	1.2
Freeway	4.2	3.0	1.2
Expressway	4.2	3.0	1.2
Main Road	4.1	2.6	1.5
Sector Road	4.0	2.4	1.6

Step 6: Solve for the structural number, SN

The preceding steps 1-5 were independent. However, a value must be obtained for each one in order to complete step 6, solving for the structural number. The structural number can be solved for using the equation below, using a trial-and-error procedure.

$$\log_{10}W_{18} = (Z_R)(S_o) + 9.36\log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2-1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32\log_{10}M_R - 8.07$$

Where:

W_{18} = Equivalent Single Axle load, Step 1
M_R = Soil Resilient modulus, Step 2
S_O = Overall Standard Deviation , Step 3
Z_R = Standard Normal Deviate, Step 4
ΔPSI = Design Serviceability loss, Step 5

Or the solution may be obtained by using the nomograph in Figure 600.01 on page 600.10.

Step 7: Determine pavement and base thickness

Once determined from step 6, the structural number is used to determine the thickness of each pavement material layer using the appropriate material coefficients from Table 600.06.

Table 600.06
Pavement Material Coefficients

Pavement Material	*Coefficient (per cm)*
	a_i
Asphaltic Concrete	0.17
Aggregate Base	0.05
Sand-Asphalt Base	0.08
Soil Subbase	0.04