

2010-2011

1(a)

For surface course,

$$D_1 = \frac{SN_1}{a_1 m_1} = \frac{2}{0.40 \times 1} = 5''$$

$$SN_1^* = (a_1 m_1) D_1 = (0.40 \times 1) \times 5 = 2$$

For base course,

$$D_2 = \frac{(SN_2 - SN_1^*)}{a_2 m_2} = \frac{(3.50 - 2)}{0.13 \times 0.95}$$

$$= 12.15''$$

$$= 13''$$

$$SN_2^* = (a_2 m_2) D_2 = (0.13 \times 0.95) \times 13 = 1.6055$$

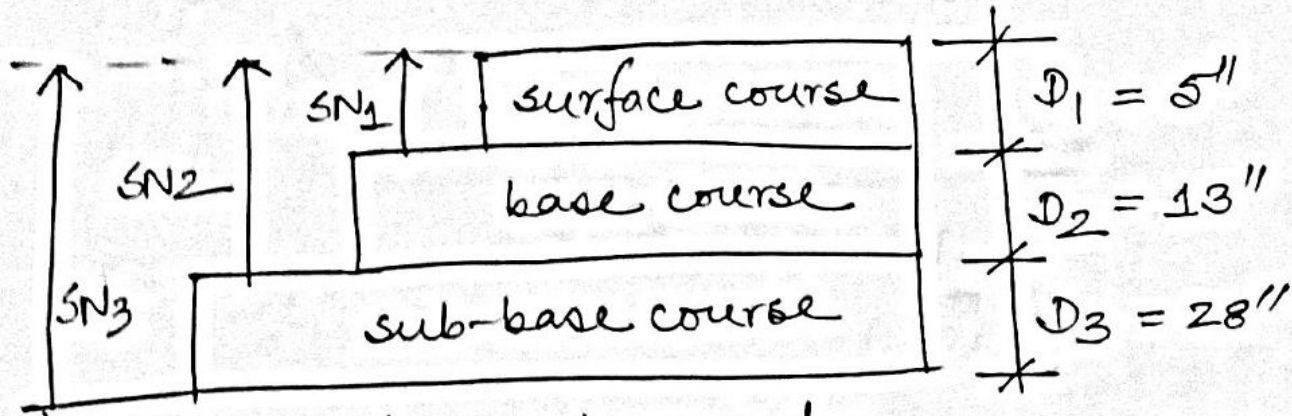
For sub-base course,

$$D_3 = \frac{SN_3 - (SN_2^* + SN_1^*)}{a_3 m_3} = \frac{5.50 - (2 + 1.6055)}{0.075 \times 0.90}$$

$$= 28''$$

check

$$\begin{aligned} SN_3 &= a_1 m_1 D_1 + a_2 m_2 D_2 + a_3 m_3 D_3 \\ &= (0.40 \times 1) \times 5 + (0.13 \times 0.95) \times 13 + (0.075 \times 0.90) \times 28 \\ &= 5.50 \text{ (ok)} \end{aligned}$$



Subgrade or improved
roadbed course