

BAE 312 Design Engineering

Assignment Project

Problem (1)

Design the following bridge.

7.5 DESIGN OF A SLAB BRIDGE

a. Data and Specifications

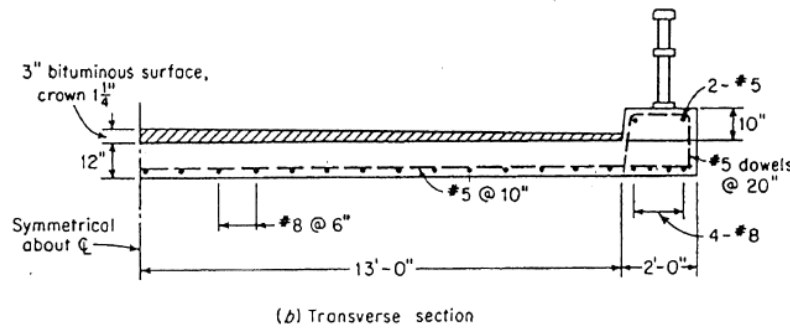
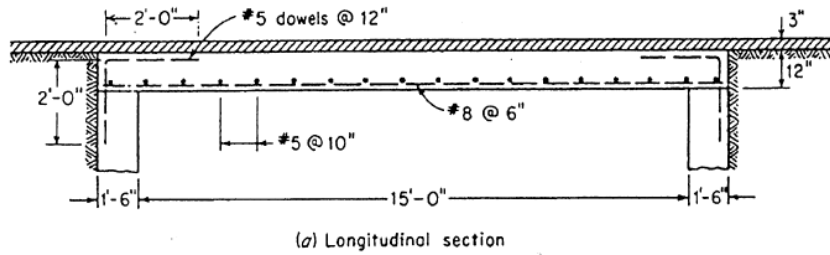


Figure 7.18

Details of a slab bridge: (a) longitudinal section (b) transverse section

Problem (2)

Design the following bridge.

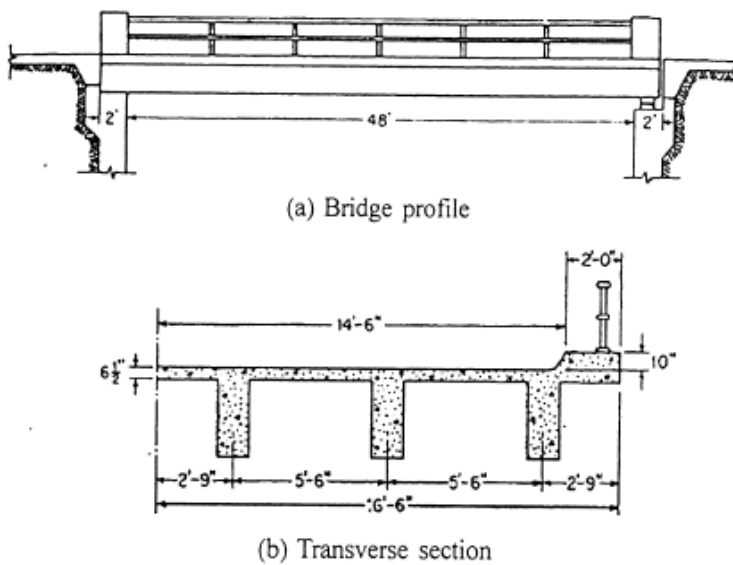


FIGURE 7.19

Problem (3)

Estimate the settlement of the raft (or mat) foundation for the “Savings Bank Building” given by Kay and Cavagnaro (1983) using the author’s procedure. Given data are as follows:

$$q_o = 134 \text{ kPa} \quad B \times L = 33.5 \times 39.5 \text{ m} \quad \text{measured } \Delta H = \text{about } 18 \text{ mm}$$

Soil is layered clays with one sand seam from ground surface to sandstone bedrock at -14 m ; mat at -3 m .

$$E_s \text{ from } 3 \text{ to } 6 \text{ m} = 42.5 \text{ MPa} \quad E_s \text{ from } 6 \text{ to } 14 \text{ m} = 60 \text{ MPa}$$

$$E_s \text{ for sandstone } \geq 500 \text{ MPa}$$

Problem (4)

The geotechnical consultant on a foundation project has obtained the soil data and profile as shown on Fig. E5-9. A best average of N values (they were nearly constant as in Fig. P3-10) gave $N'_{70} = 20$ shown. Column loads including dead and live loads are estimated in the range of 450 to 900 kN (100 to 200 kips).

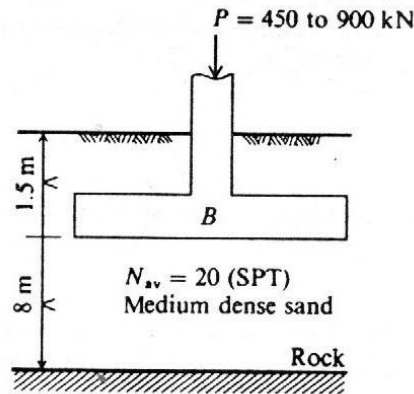


Figure E5-9

Required. Recommend q_a for this project so that ΔH is limited to not over 25 mm.

Problem (5)

Compute the immediate elastic settlement for the soil–footing system shown in Fig.

