NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF ARCHITECTURE AND QUANTITY SURVEYING

DEPARTMENT OF ARCHITECTURE
BACHELOR OF ARCHITECTURAL STUDIES (HONOURS) DEGREE

PART II END OF SECOND SEMESTER EXAMINATIONS – JUNE 2004
AAR 2205 – STRUCTURAL DESIGN II

Instructions   _Time_ : *3 Hours*

Answer All Questions.
Students are allowed to carry B.S 8110

QUESTION 1

The reinforced concrete floor shown in plan below is required to carry the following loads and to satisfy B. S. 8110. The conditions of exposure are mild. The beam and slab are cast separately and they are not monolothic.

Loading on the slab

a)   Imposed = 5 KN/m^2

b)   Finishes and partitions = 4.5KN/m^2

Material strength,

f_{cu} = 35 N/mm^2

f_y = 460 N/mm^2 for the main reinforcement.

   = 250 N/mm^2 for the links.

Design the floor slab and beam.

PLAN OF FLOOR

[45]

QUESTION 2

2.   A reinforced concrete staircase is shown below. It is to be designed to satisfy B. S. 8110 and the following data.
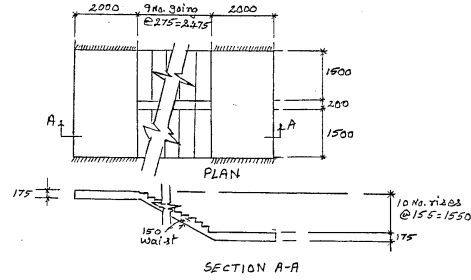
a) The imposed load is 3 KN/m^2
b) The finishes are – 13 mm plaster on underside of the flight and landings, 25 mm terrazza tiles on 13 mm screed on the treads and the landings.

c) f_{eu} = 35 N/mm^2

d) f_y = 460 N/mm^2

e) The conditions of exposure are mild.

PLAN

SECTION A-A

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QUESTION 3

A reinforced concrete column and pad foundation is required to satisfy B. S. 8110 and the following .

a) Axial imposed load = 500kN
b) Axial dead load = 1000kN
c) The loads are transferred to the base through a centrally positioned column which is 400 mm square.
d) The pad is square
e) The safe ground bearing pressure = 150 kNm2
f) f_{eu} = 35 N/mm^2
g) f_y = 460 N/mm^2
h) Column is short and braced.
i) Supervision is normal.
j) Mild exposure evolution
k) Design the column and pad

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