# CE 382 HOMEWORK 4

Due Date & Time: May 3, 2015 @ 17.00

Q1. Sketch the reinforcement of members shown below under the given loadings.

p (kN/m²)

A   B

section A-A   section B-B

A   B

side view   front view   front view

A   B

section A-A   section B-B

A   B

A   B   p (kN/m²)

side view   front view   front view

A   B   p (kN/m²)

section A-A   section B-B

A   B

side view   front view   front view

Earthquake

section A-A   section B-B

B --------- B   Earthquake   Earthquake

A --------- A

Retaining Wall   top view   top view

side view
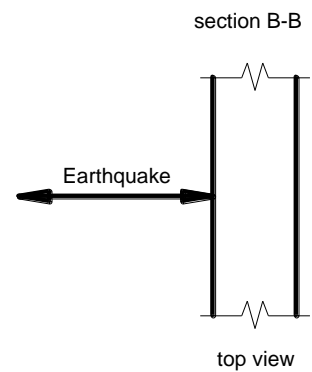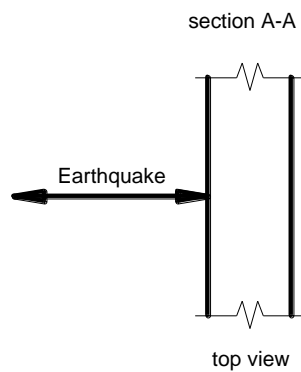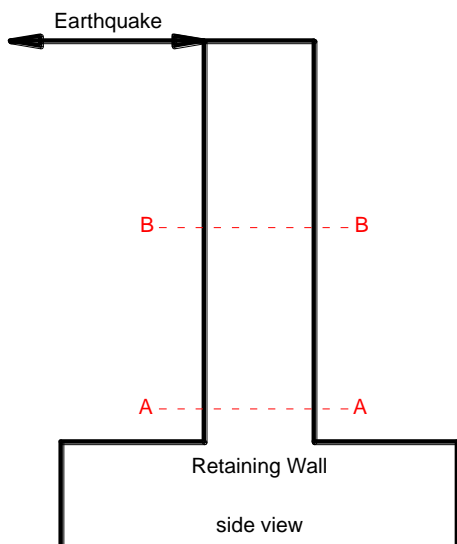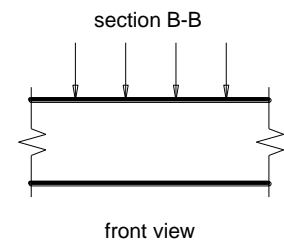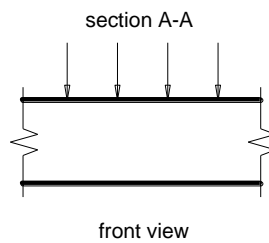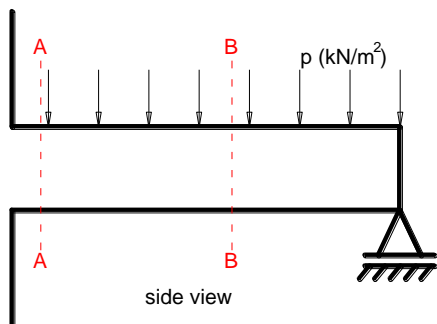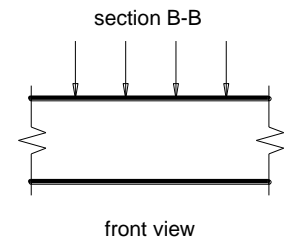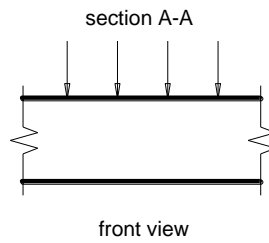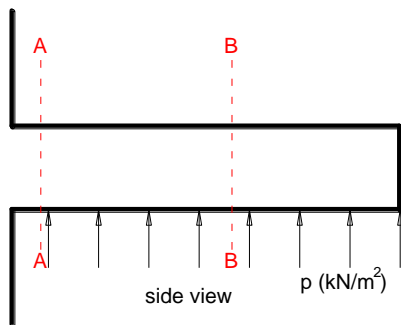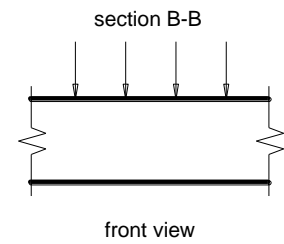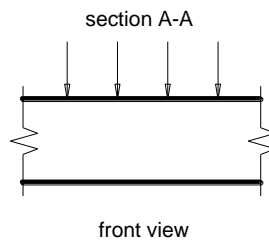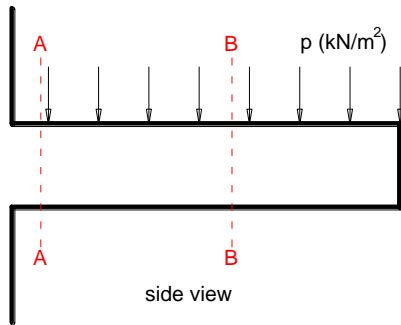
Q2. The column section is 250×450 mm as shown below. Materials are C30 and S420. The design values for N_d and M_d' (including second order moments) obtained from different load combinations are given below. Calculate the necessary reinforcement area for $M_{d,y}'$ (strong direction) and show the reinforcement pattern. Use only $\phi16$ bars.

C30
S420

y

x

250

450 mm
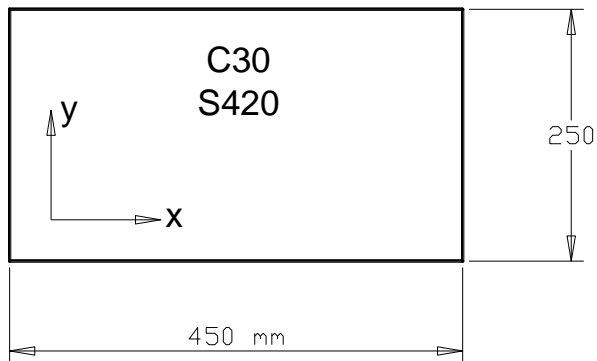
N_d (kN)	$M_{d,y}'$ (kNm)	$M_{d,x}'$ (kNm)
300	194	90
750	210	107
1200	135	90
1500	125	80

Afterwards, draw the interaction diagrams both for the strong and weak directions by using the excel sheet prepared by Prof. Özcebe and show all eight axial load-moment force couples on the diagrams.

Q3. Solve Problem 6.10 of the course book on page 378.