
DESIGN OF REINFORCED & CONCRETE STRUCTURES

ASSIGNMENT:1

1. Calculate the base shear for a five storey hospital building having special moment resisting frame (SMRF) located in Ahmedabad on medium soil with following data using seismic coefficient method.
 - (i) No. of bay in x and y-direction = 4
 - (ii) Width of each bay = 5 m
 - (iii) Thickness of slab = 150 mm
 - (iv) Storey height = 3 m
 - (v) Size of beam and column = 300 mm x 450 mm
 - (vi) Amount of damping = 10 % of critical damping
 - (vii) Live load = 4 kN/m²Assume any additional data if required and neglect the weight of the infill wall panels. Calculate the lateral forces at each floor level of hospital building of using seismic coefficient method.
2. Calculate base shear in the critical direction only for BSNL office in Kohima with following data by seismic coefficient method. (a) No. of storey = 4 (b) No. of bay in x direction = 3 (c) No. of bay in y direction = 1 (d) storey height = 3 m (e) Width of each bay = 5 m (f) Total DL on roof = 12 kN/m² (g) Total DL on floor = 10 kN/m² (h) LL = 4 kN/m² (i) Thickness of slab = 120 mm All columns having their longer side in X direction. Neglect weight of infill walls. Assume suitable data if required. Write all your assumptions & clauses of IS 1893 (2002). Building is provided with additional viscous dampers which will increase damping by 3%.

Calculate lateral forces in the critical direction only at each floor level along with diagram of distribution of lateral force at each floor level.

3. If a column of size 350 mm × 550 mm is having the longitudinal reinforcement of 1.65 % of the gross cross sectional area. Detail the longitudinal reinforcement of the column satisfying all criteria of IS 13920- 1993 and workout the special confining hoop reinforcement as per the code along with neat sketch of longitudinal section. Take the clear height of the column = 4 m. Take concrete grade = M20, steel grade = Fe 415 and clear cover to longitudinal reinforcement = 40 mm.
4. Explain concept of ductile detailing & explain factor affecting the ductility of structures in detail. Explain ductile detailing of beam as per IS 13920 – 1993.
5. Draw and detail the typical qualitative reinforcement detailing of two span reinforced concrete continuous rectangular beam of dimension 300 mm × 550 mm as per IS 13920-1993 (ductile detailing provisions).

