Birzeit University

Faculty of Engineering

Department of Civil and Environmental Engineering

ENCE 335, Reinforced Concrete Design I

Homework assignment #3

Due on Thursday, Oct. 29th, 2019 @ 11:59 PM.

For a continuous beam with 4 equal spans of 5m. The beam supports a service dead load of 100 kN/m (including self-weight), and a service live load of 40 kN/m. Prepare your work according to the following steps:

1. Develop the load cases to maximize the positive moment at the middle of each span as well as the negative moment at each support.

2. Use ACI coefficients to draw shear and moment diagram of the beam

3. Use the smallest value of the moment (absolute value) to determine the required dimensions for a reinforcement ratio within the recommended range. Select the dimensions such that the ratio of effective depth (d) to the width (B) is within the recommended range. Use multiples of 5 cm for h and b.

4. If the beam dimensions are limited to (B=300mm, H=500mm) by the architect. Select the reinforcement required for all positive and negative moments. (Note that some moments will require compression and tension reinforcement)

5. Present your design showing the location and the extension of each reinforcement using side views, sections and details as appropriate.

Use fc' = 28 MPa, fy = 420 MPa