CE243A - DESIGN AND RESPONSE OF RC STRUCTURAL SYSTEMS

Problem Set #6: Beam – column joints

Due: 29 Nov. 2004

6.1 Proportion and detail an interior and exterior beam-to-column connection for the SMF example from the class notes (Chapter 5). Use $f'_c = 4000$ psi and $f_y = 60$ ksi. Assume you are evaluating an exterior connection in a system with multiple bays in both directions; however, check requirements for both Normal and Spandrel directions. For the spandrel direction, assume the beam is the same as for the Normal direction, except as noted below.

(a) Interior Connection

Consider loads parallel to the SMF at the edge of the building (as done in the notes). Clearly indicate what assumptions you make for slab thickness and slab reinforcement.

Check that your column satisfies a strong column design (ACI 318-02), and then design the joint. Modification of the column and beam geometries and/or reinforcement may be necessary. Assume you are evaluating an interior connection in a system with multiple bays in both directions.

(b) Exterior Connection

For the exterior joint, assume the beam web and depth in the transverse direction is the same as the beam parallel to the edge of the building; however, redefine the effective slab width for the condition where the slab exists on both sides of the web

Resize the column as needed to satisfy the strong column design (ACI 318-02), and then design the joint. Modification of the column and beam geometries and/or reinforcement may be necessary.