1. Strut-and-tie models for a dapped end beam may be constructed by two basic STM as shown on page 72 of the textbook. For given data construct a STM by combination of two with nodal zones of finite dimensions and calculate component forces. Sketch reinforcement scheme by STM and determine the sectional steel area according to ACI 2005. $f_c' = 30 MPa$, $f_y = 460 MPa$

(mm)
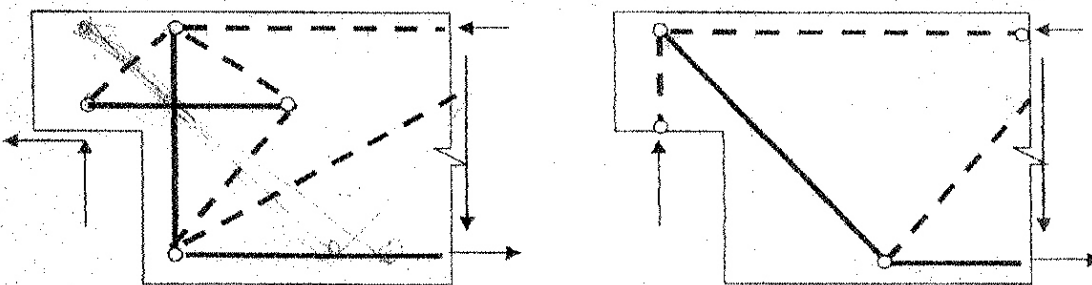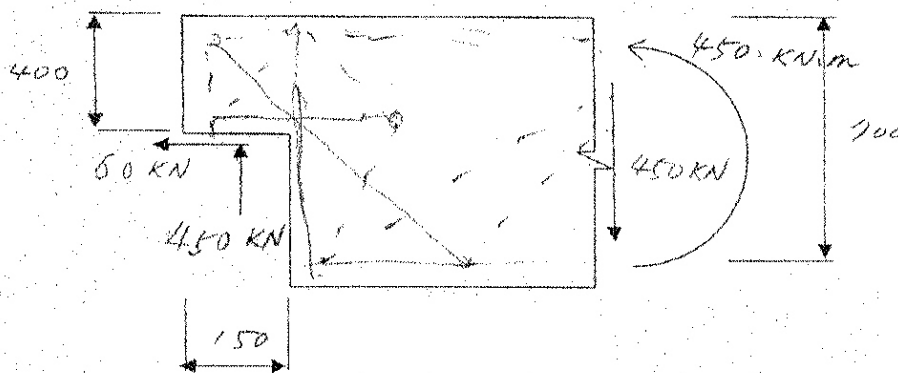
2. Construct STM for wall of T-section using STM for compression flange and tension flange on pages 46-47 and STM for wall on page 76. The bottom of wall is fixed and the uniformly distributed shear force on the top is applied. Calculate required sectional area of ties with checking strength of struts subjected to shear forces in both directions. Note that shear is mainly transferred along web. Shear force is 400kN/m, D=2000mm, the thickness of wall =200mm. $f_c' = 30MPa, f_y = 460MPa$
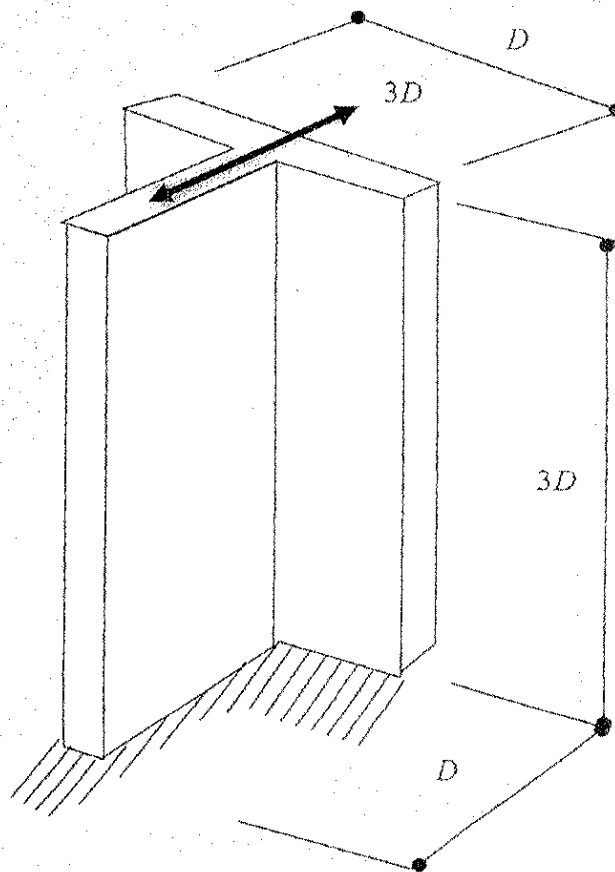
3. Referring to STM in Fig. 2.80 of the textbook draw STM for the following cases.
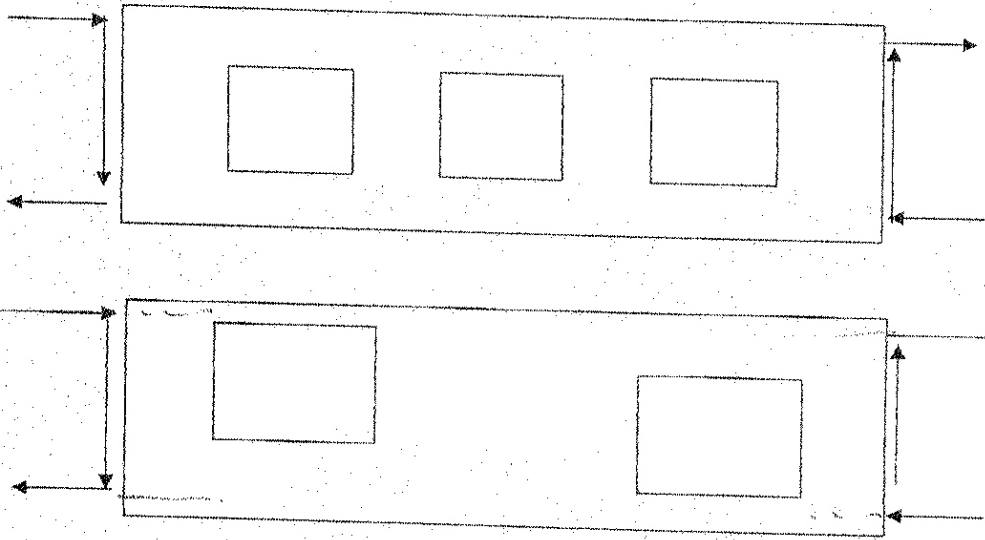
4. Propose possible failure mechanisms for interior beam-column joint and suggest a model for the maximum shear deformation controlled by the diagonal strut.