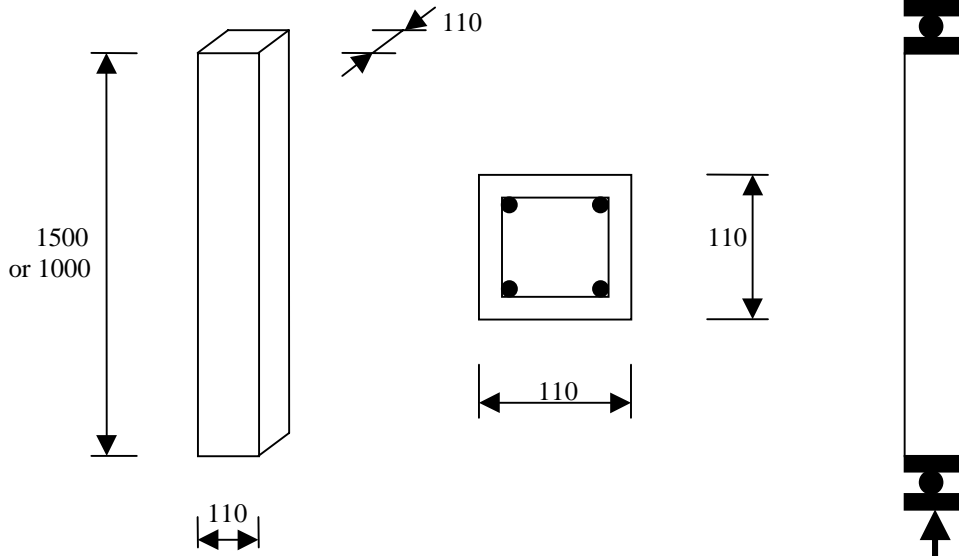


Tutorial Sheet for Concrete Columns

Name: _____

Column designs, dimensions and loading



For 1.5m column,
 $P_{ult} = 557\text{kN}$

For 1m column,
 $P_{ult} = 555\text{kN}$

Concrete cube strength $f_{cu} = 51.0\text{N/mm}^2$, tensile strength $f_t = 5.49\text{N/mm}^2$. Longitudinal reinforcement 4T12 bars, with cover 15mm. Closed links 3mm ϕ spaced 100mm c/c. Two column lengths are 1500 or 1000mm, both concentrically loaded. $E_{conc} = 30,000\text{ N/mm}^2$ and $E_{steel} = 200,000\text{ N/mm}^2$.

Classify each column as short or slender assuming an unbraced situation.

Comment on the design of the columns in terms of longitudinal steel percentage, provision of links and slenderness.

Comment briefly on the behaviour of each column through to failure. Comment on whether you think this behaviour was to be expected, and why. In particular, would you have expected different behaviour for each column?
