

2. Construction science principles

Worksheet 14: Stress and strain (learner)

Engineers use various calculations to establish whether a designed structure is safe. Some of these calculations are used to determine:

- stress – calculated using force/area
- strain – calculated by the variation in length/original length, and represented by a ratio.

1. A force of 450kN is exerted over a square concrete column of side length 300mm. Calculate the stress within the concrete.

2. The allowable stress within a steel beam carrying a load of 300N is 1.33N/mm^2 . Calculate the cross-sectional area of the steel beam in mm^2 .

3. A column is axially loaded, and contracts 0.15mm. The length of the column is 3500mm. Calculate the strain.