

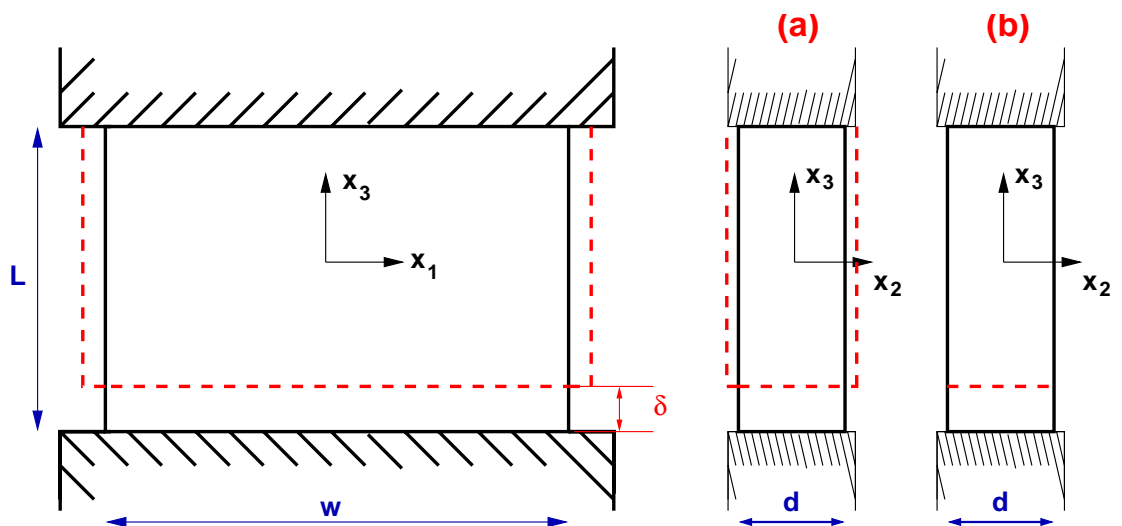
16.21 - Techniques of structural analysis and design

Homework assignment # 4

Handed out: Lecture 13

Due: Lecture 16

1. Consider the block of material shown in the figure. Determine the complete elasticity solution, i.e., all the elastic fields $\mathbf{u}, \sigma, \epsilon$, when the block is subjected to the imposed displacement δ as shown in the figure. The block is made of a material that can be modeled as elastic and isotropic with Young's Modulus E and Poisson's ratio ν . Assume perfect sliding at the interface between the block and the walls. Two different scenarios are to be considered:
 - (a) $d \ll L, d \ll w$ and the lateral walls of the block—those determined by the equation of the planes $x_2 = \pm \frac{d}{2}$ —are unrestrained in the x_2 direction, i.e. the plate can expand out of its plane.
 - (b) The lateral walls of the block are not allowed to expand out of its plane.



2. Problem 4.4 from textbook
3. Problem 4.5 from textbook
4. Problem 4.7 from textbook
5. Problem 4.9 from textbook