

CIV-E4040 Reinforced Concrete Structures

Examination 16.4.2020 (remote examination using My Course)

A precondition for the participation in the examination is the fulfilment of compulsory parts of the course in the spring 2020 or earlier.

Question 1

This question is to be answered using the online option of the assignment within the period given

1. Answer the following questions. (altogether 9p)
 - a) Explain reasons for using inclined stirrups against shear force but not against torque. (2p)
 - b) What is the influence of concrete cracking on imposed deformations resulting from the change of temperature? What is the importance of imposed deformations in the ultimate limit state design? (2p)
 - c) In the figure below, the symbol B indicates the stress-strain diagrams for reinforcing steel. Which one of the diagrams B describes better the behaviour of steel material?(1p) Which one of the diagrams B should be used to guarantee ductile behaviour of structural systems?(1p)

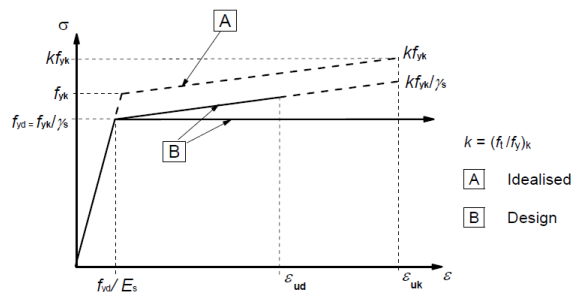
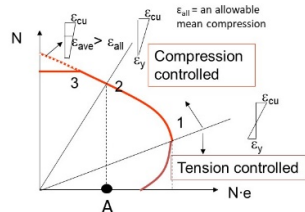


Figure 3.8: Idealised and design stress-strain diagrams for reinforcing steel (for tension and compression)

- d) What can be said about the strain and stress distributions at the point A shown in the figure below? (2p)



- e) Why can the load-bearing capacity of a beam against shear force or torque be smaller than the capacity produced by the beam reinforcement?(1p)