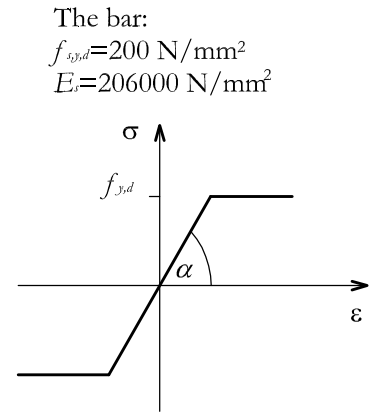
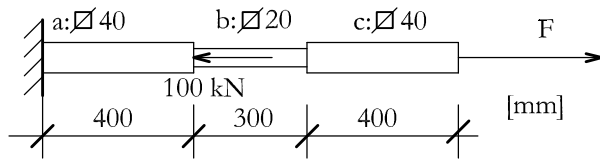
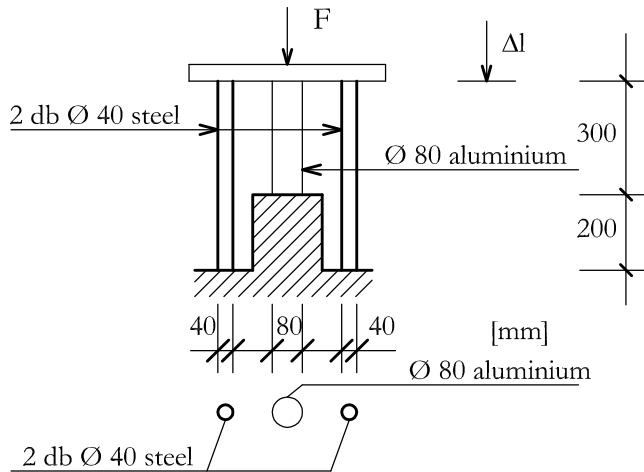


- 1/a.) Draw the F- Δl diagram of the system!  
 1/b.) What is the deformation of the system, if F=50 kN?  $\sigma_a=?$ ,  $\sigma_b=?$ ,  $\sigma_c=?$   
 1/c.) What is the value of F, if  $\Delta l=0,25$  mm!



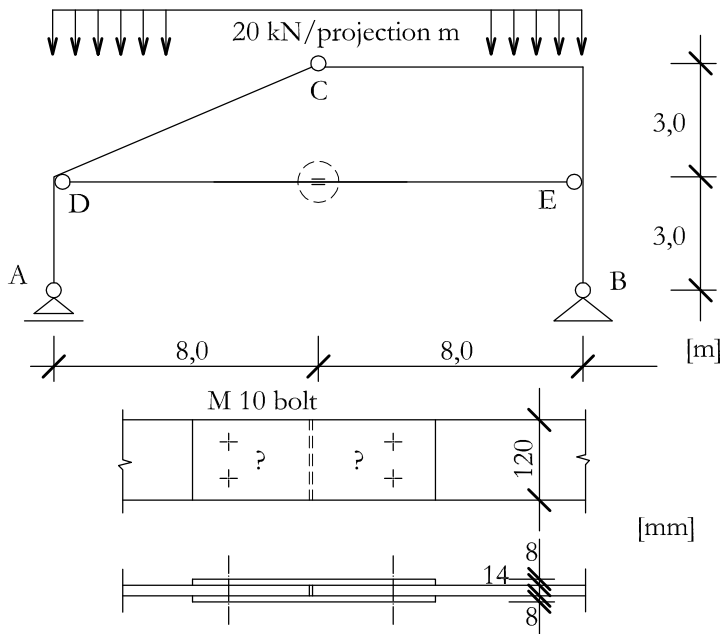
- 2/a.) Draw the F- Δl diagram of the system!  
 2/b.) What is the compressive force, if  $\Delta l=0,35$  mm?  
 2/c.) What is the deformation of the system, if F=1000 kN?



Steel :  
 $f_{y,d}=200$  N/mm<sup>2</sup>  
 $E_s=210000$  N/mm<sup>2</sup>

Aluminium :  
 $f_{t,d}=100$  N/mm<sup>2</sup>  
 $E_{al}=75000$  N/mm<sup>2</sup>

- 3.) Design the number or the rows of the bolts and check the joint!



Plates:  
 $f_{y,d}=235$  N/mm<sup>2</sup>  
 $f_{u,d}=288$  N/mm<sup>2</sup>

Bolts:  
 $f_{y,d}=231$  N/mm<sup>2</sup>  
 $f_{u,d}=400$  N/mm<sup>2</sup>

- 4/a.) Calculate the normal stress values at the location of  $\pm M_{max}$  in elastic state, draw stress diagrams!  
 4/b.) Check the beam in plastic state if  $f_t=22$  N/mm<sup>2</sup> !

