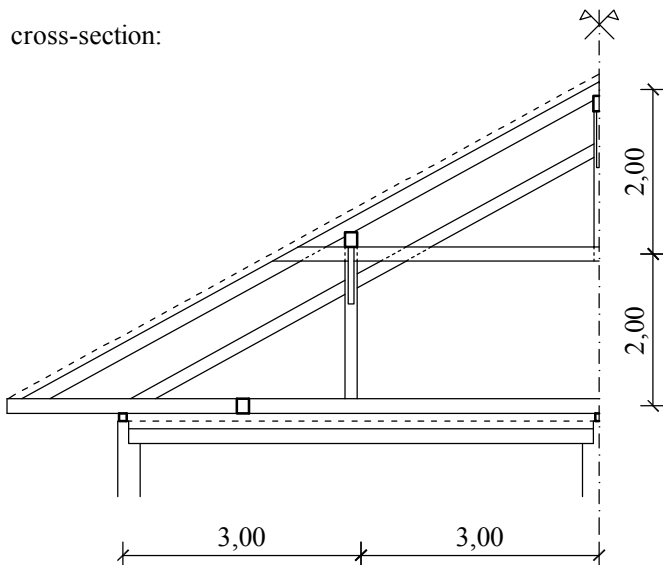
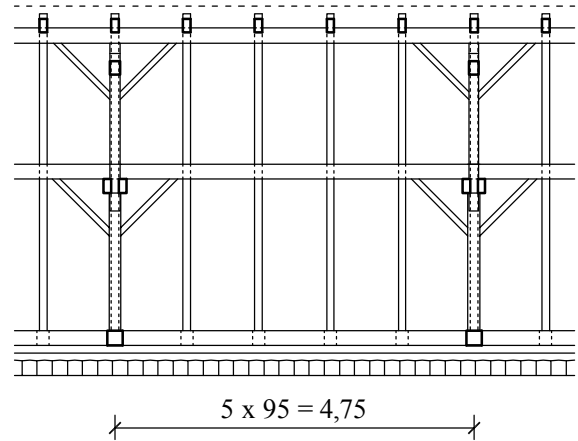


# STEEL AND TIMBER STR. - HOMEWORK 2. - deadline: 30.11.2012.

cross-section:



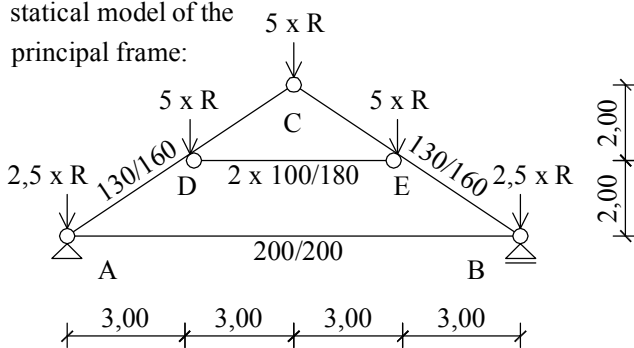
longitudinal section:



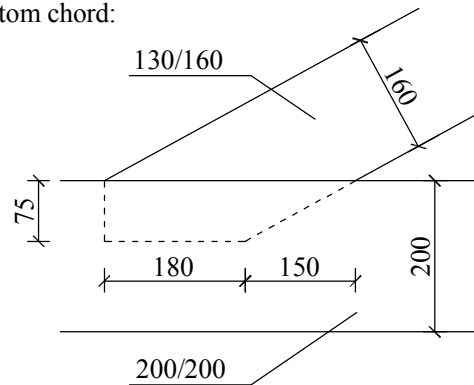
Traditional roof structure of an apartment building from 1892 (1st district, Budapest, Hungary)

C24 material, 2nd service class, short-term load

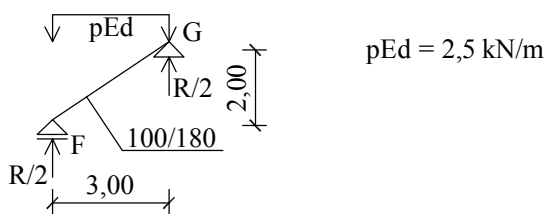
statical model of the principal frame:



connection of the strut and the bottom chord:

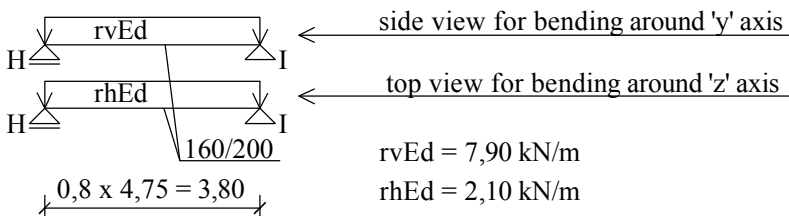


statical model of the rafter:



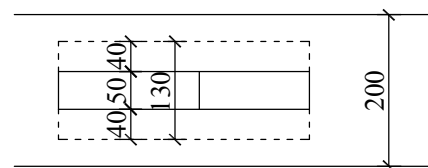
$$pEd = 2,5 \text{ kN/m}$$

statical model of the middle purlin:



$$rvEd = 7,90 \text{ kN/m}$$

$$rhEd = 2,10 \text{ kN/m}$$



For the calculations of the principal frame, the given statical model should be used (the degree of statical indeterminacy is 1). The force R should be calculated from the statical model of the rafter. For the calculations of the middle purlin, the given statical model should be used (skew bending).

- Draw N, V, M diagrams of the principal frame! Draw M diagrams for the middle purlin! [15p]
- Check the collar tie (beam DE)! If it is not safe, what is the reason, what can be done? [5p]
- Check the rafter (beam FG)! If it is not safe, what is the reason, what can be done? [5p]
- Check the middle purlin (beam HI)! If it is not safe, what is the reason, what can be done? [7p]
- Check the connection of the strut and the bottom chord (point A)! If it is not safe, what is the reason, what can be done? [8p]