Remarks: See §4.4, pages 168 till 170
See §4.5.4, pages 179 till 182

Hints:
Schematize the beam as a line element and draw all the forces and couples that act on this line.

Answers:

b. In cross–sections B and C.
$\sigma_t = +1,52$ N/mm^2 and $\sigma_b = -14,13$ N/mm^2

c. In cross-section E.
$\sigma_t = -9,97$ N/mm^2 and $\sigma_b = +1,95$ N/mm^2

d. 98 mm

Explanation:

a. The pre-stressing tendon applies eccentric compressive forces on the beam ends. This causes a normal force and a bending moment:

$N = -1200$ kN ; $M_z = Ne = (-1200 \text{ kN})(0{,}09 \text{ m}) = -108$ kNm

b. At the cross-sections of B and C:
$N = -1200$ kN ; $M_z = (-108 \text{ kNm}) + (-85 \text{ kNm}) = -193$ kNm
$\sigma^{(N)} = -5$ N/mm^2 ; $\sigma_t^{(M)} = +6,52$ N/mm^2 ; $\sigma_b^{(M)} = -9,13$ N/mm^2

c. At cross-section E:
$N = -1200$ kN ; $M_z = (-108 \text{ kNm}) + (+255 \text{ kNm}) = +147$ kNm
$\sigma^{(N)} = -5$ N/mm^2 ; $\sigma_t^{(M)} = -4,97$ N/mm^2 ; $\sigma_b^{(M)} = +6,95$ N/mm^2

d. $a = \dfrac{1,95}{1,95 + 9,97} \times 600 = 98$ mm