Interventions – reinforcement

TIMBER HUB

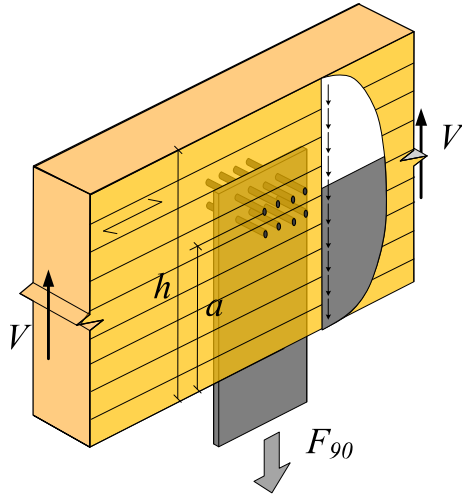
- Connection loaded perpendicular to grain

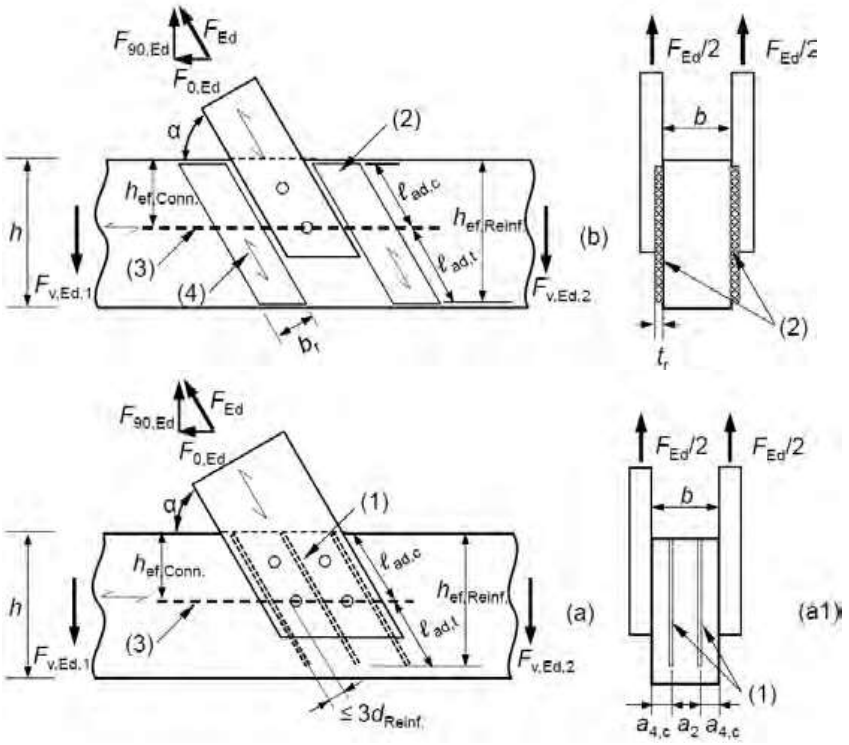
Interventions – reinforcement

TIMBER HUB

- Connection loaded perpendicular to grain
  - Force on reinforcement:

$$F_{t,90,Ed} = [1 - 3\alpha^2 + 2\alpha^3]F_{90,Ed}$$





Interventions – reinforcement

TIMBER HUB

- Curved and cambered beams

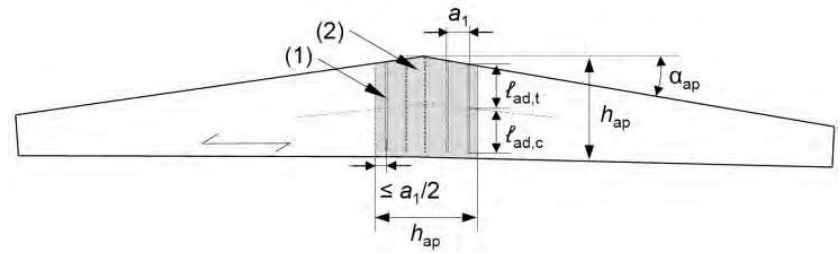
Interventions – reinforcement

TIMBER HUB

- Curved and cambered beams
  - Force on reinforcement:

$$F_{t,90,Ed} = k_{ka} \cdot \sigma_{t,90,d} \cdot b \cdot a_1$$

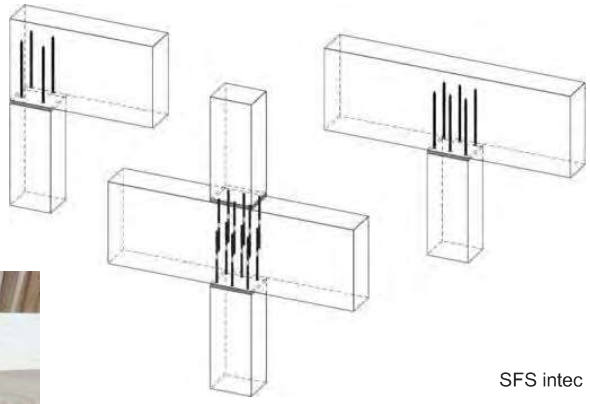
  - Where:
  - $k_{ka} = 1.0$ for curved beams & in inner quarters
  - $k_{ka} = 0.67$ in outer quarters



Interventions – reinforcement

TIMBER HUB

- Compression reinforcement perp. to grain
  - Bonded-in rods
  - Screws



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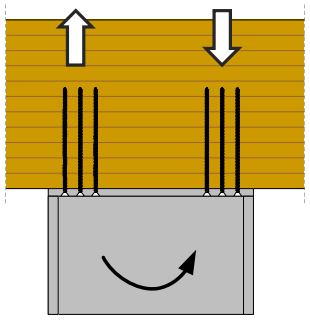
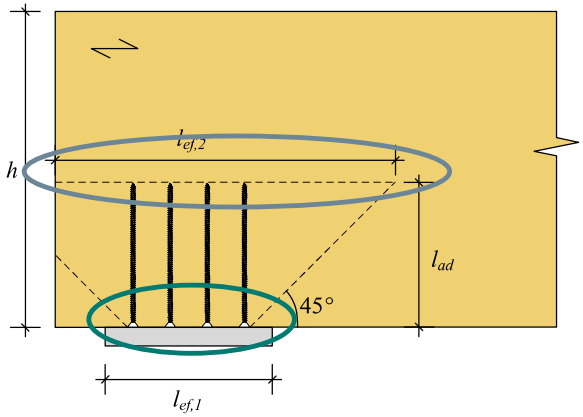


Interventions – reinforcement

TIMBER HUB

- Compression reinforcement perp. to grain
  - For reinforcement by means of self-tapping fully threaded screws with:
    - an even distribution of screws in the reinforced contact area;
    - an angel between screw axis and grain direction
    - screws perpendicular to the contact surface
    - screw heads flush with the contact surface



  - the characteristic value of the resistance of a reinforced contact area should be taken as (Bejtka & Blaß 2006)

$$F_{90,Rk} = \min\begin{cases} k_{c,90}\, b\, l_{ef,1}\, f_{c,90,k} + n \min\{F_{ax,\alpha,Rk}; F_{ki,Rk}\} \\ b\, l_{ef,2}\, f_{c,90,k} \end{cases}$$