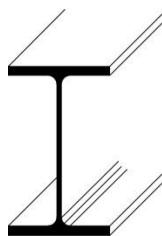


COURS STRUCTURES EN MÉTAL

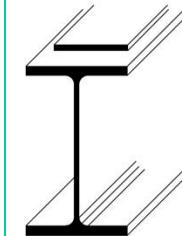
TGC 10, chapitre 5:
Dimensionnement de poutres
Semelles de renfort

Fig. 5.1: Types de poutres

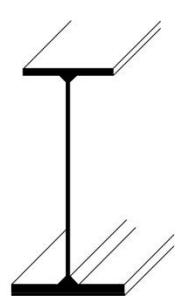
Profilé laminé



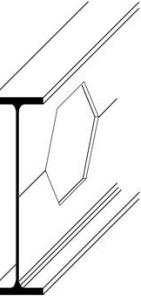
Profilé avec semelles de renfort



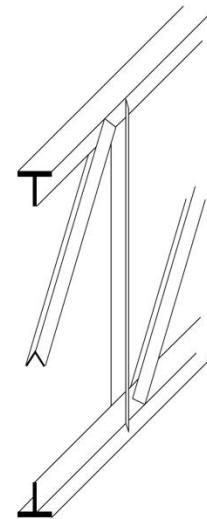
Poutre composée à âme pleine



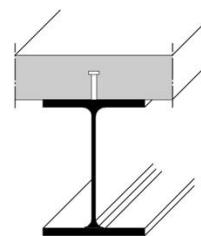
Poutre ajourée



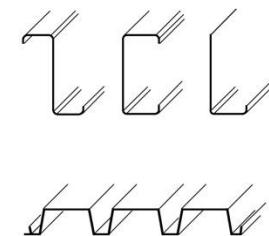
Poutre à treillis



Poutre mixte acier-béton



Elément à parois minces



Exemple: pont autoroutier, chgt épaisseur et semelles de renfort



Pont autoroutier sur la Venoge, Ecublens



Exemple: pont-route multipoutres avec semelles de renfort



Bridge at Taunton MA, USA, <http://alwayscivil.blogspot.ch/>

Exemple: pont-rail, poutres avec semelles de renfort



Pont Baarerstrasse Zug. Photos CFF

Exemple: semelle de renfort sur poutre d'essai



Problème ?
⇒ Fissuration car
faible résistance
à la fatigue
⇒ Géométrie de
l'extrémité adaptée

Fig. 5.6: principe de vérification sous forme graphique

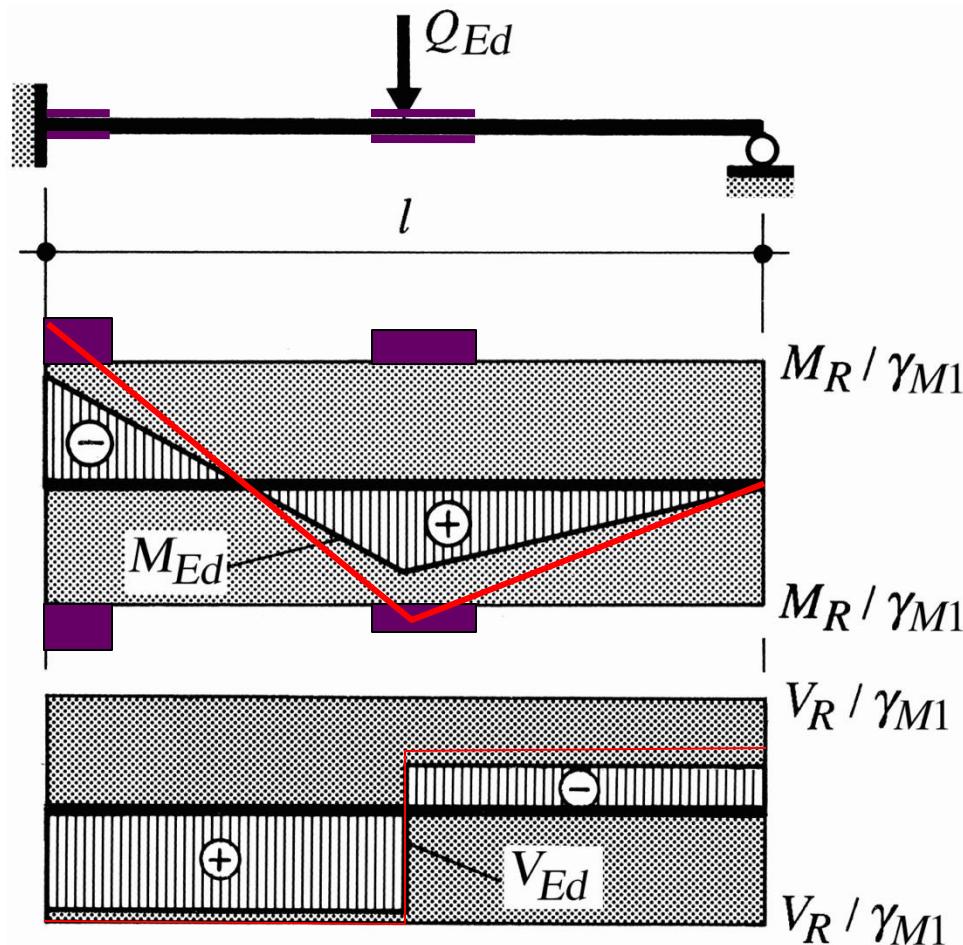
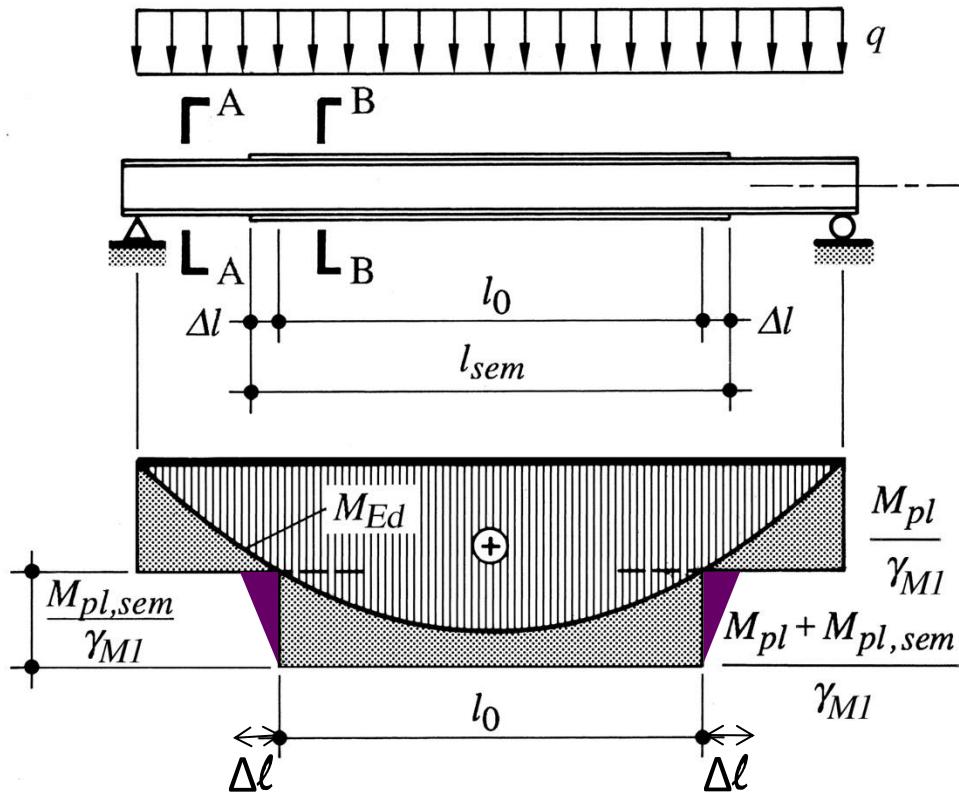


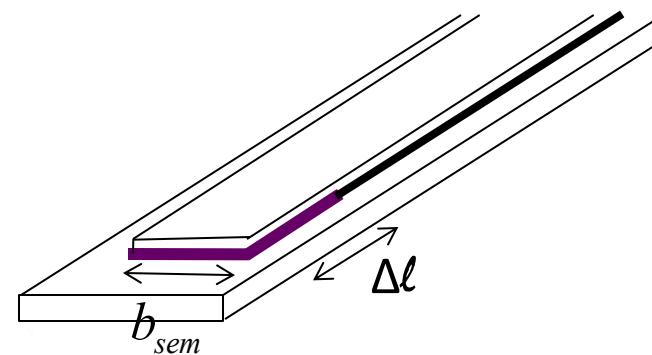
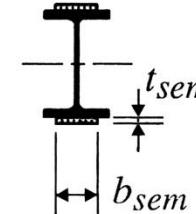
Fig. 5.13: détermination longueur des semelles de renfort



A - A

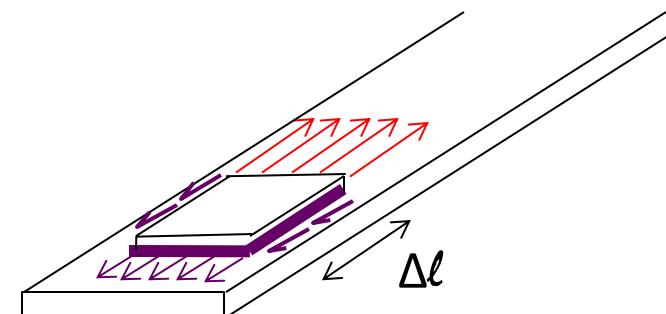
B - B

Autres possibilités

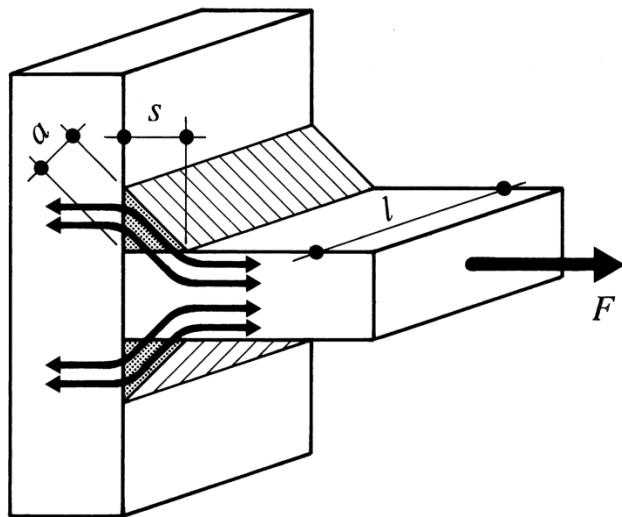


Equilibre de l'extrémité

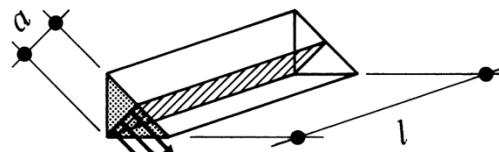
$$f_y \cdot b_{sem} \cdot t_{sem} \leq (2 \cdot \Delta l + b_{sem}) \cdot \min[R_{w,Rd}; R_{s,Rd}]$$



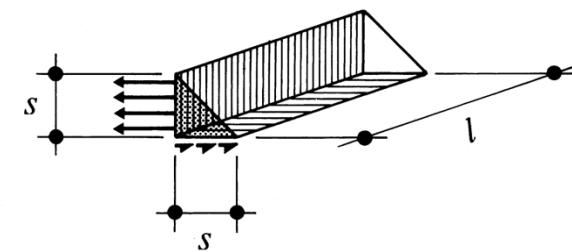
Rappel: Fig 7.11: transmission d'un effort et résistance des cordons d'angle



Section de gorge



Sections de contact



Section de gorge a

$$l_{tot} \cdot R_{w,Rd} = F_{w,Rd} = a \cdot l \cdot 0.6 \cdot \frac{f_{uE}}{\gamma_{M2}} \quad (7.4a)$$

Section de contact s

$$l_{tot} \cdot R_{s,Rd} = F_{s,Rd} = s_{min} \cdot l \cdot 0.8 \cdot \frac{f_y}{\gamma_{M2}} \quad (7.4b)$$