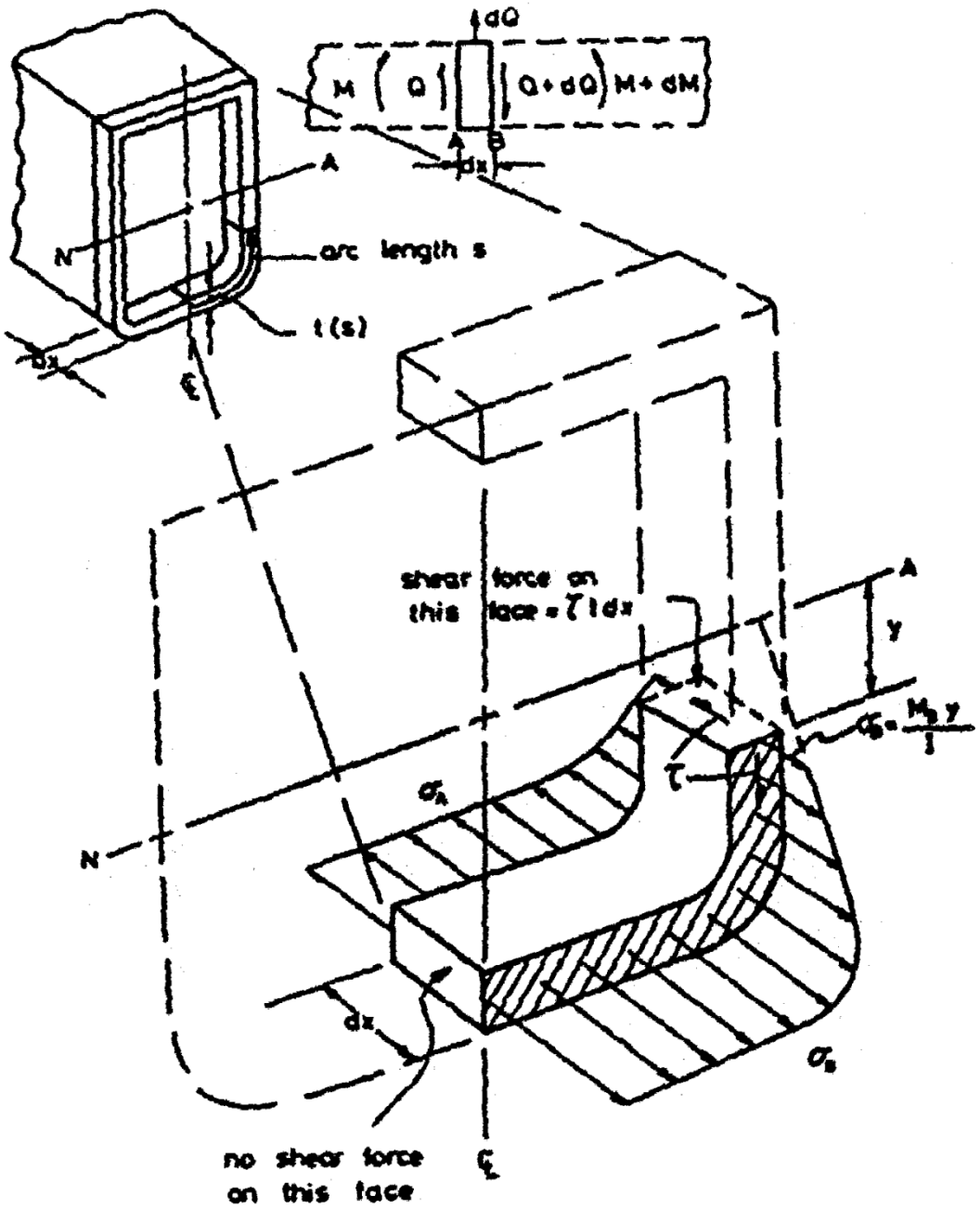
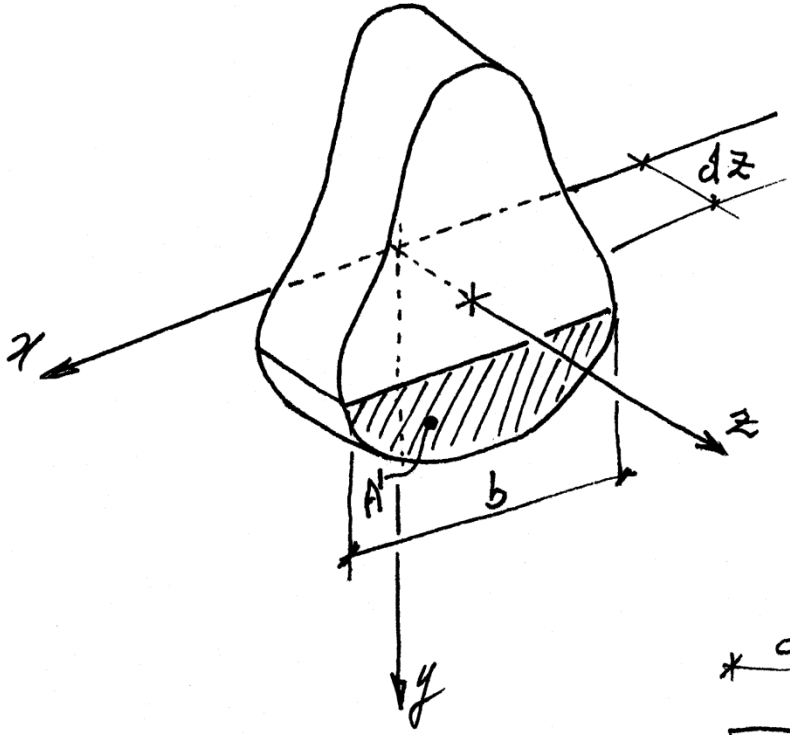
COSTRUZIONI NAVALI II

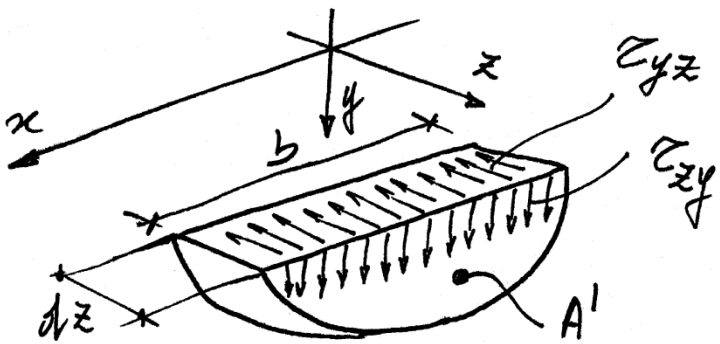
1

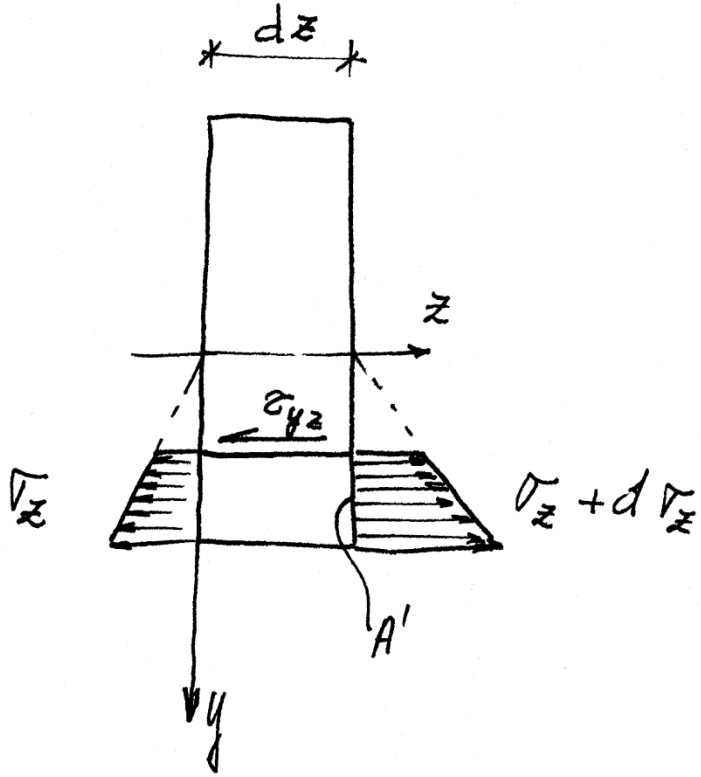
Dmitrij Ivanovič Žuravskij
(1821-1891)
Jourawski

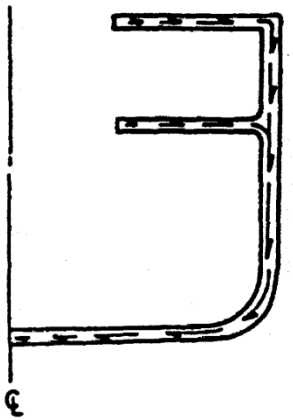


Free body diagram for transverse shear.

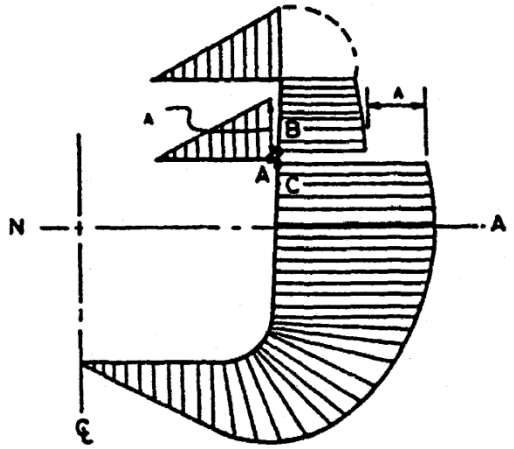

dz
x
z
A'
b
y


x
y
z
b
τyz
τzy
dz
A'

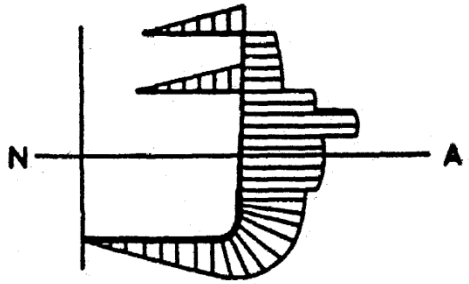

dz
z
τyz
σz
σz + dσz
A'
y



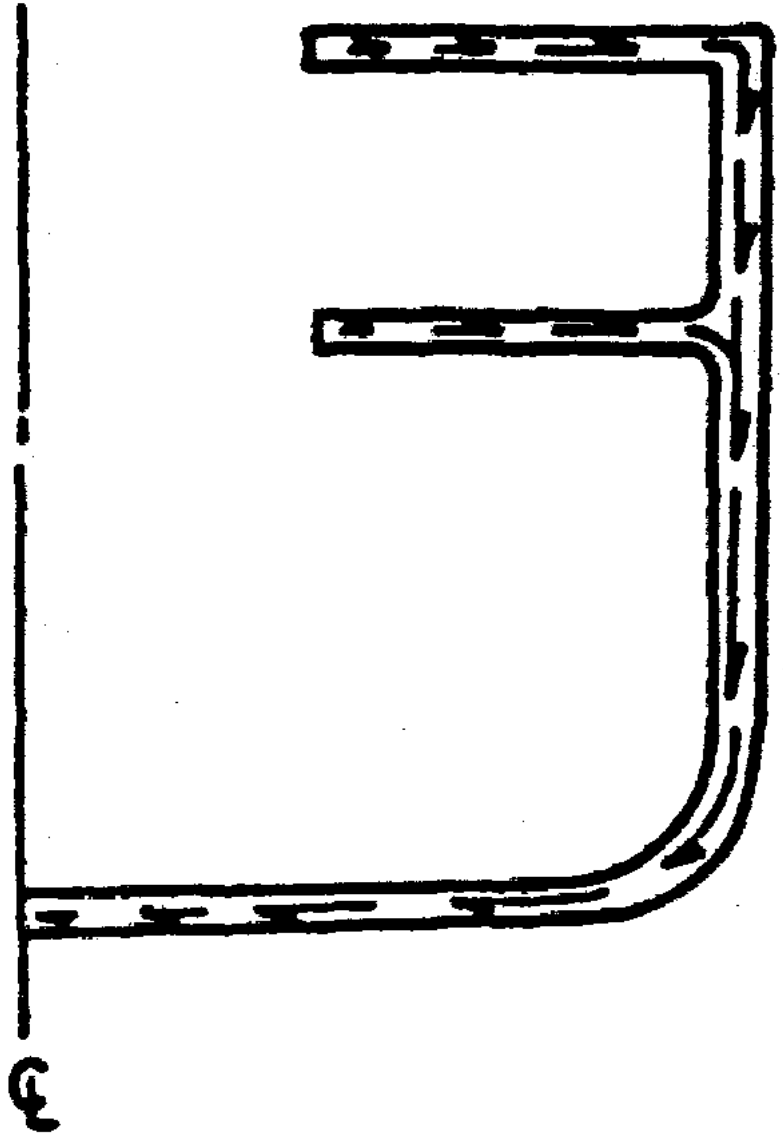
Sample diagram indicating direction of shear flow



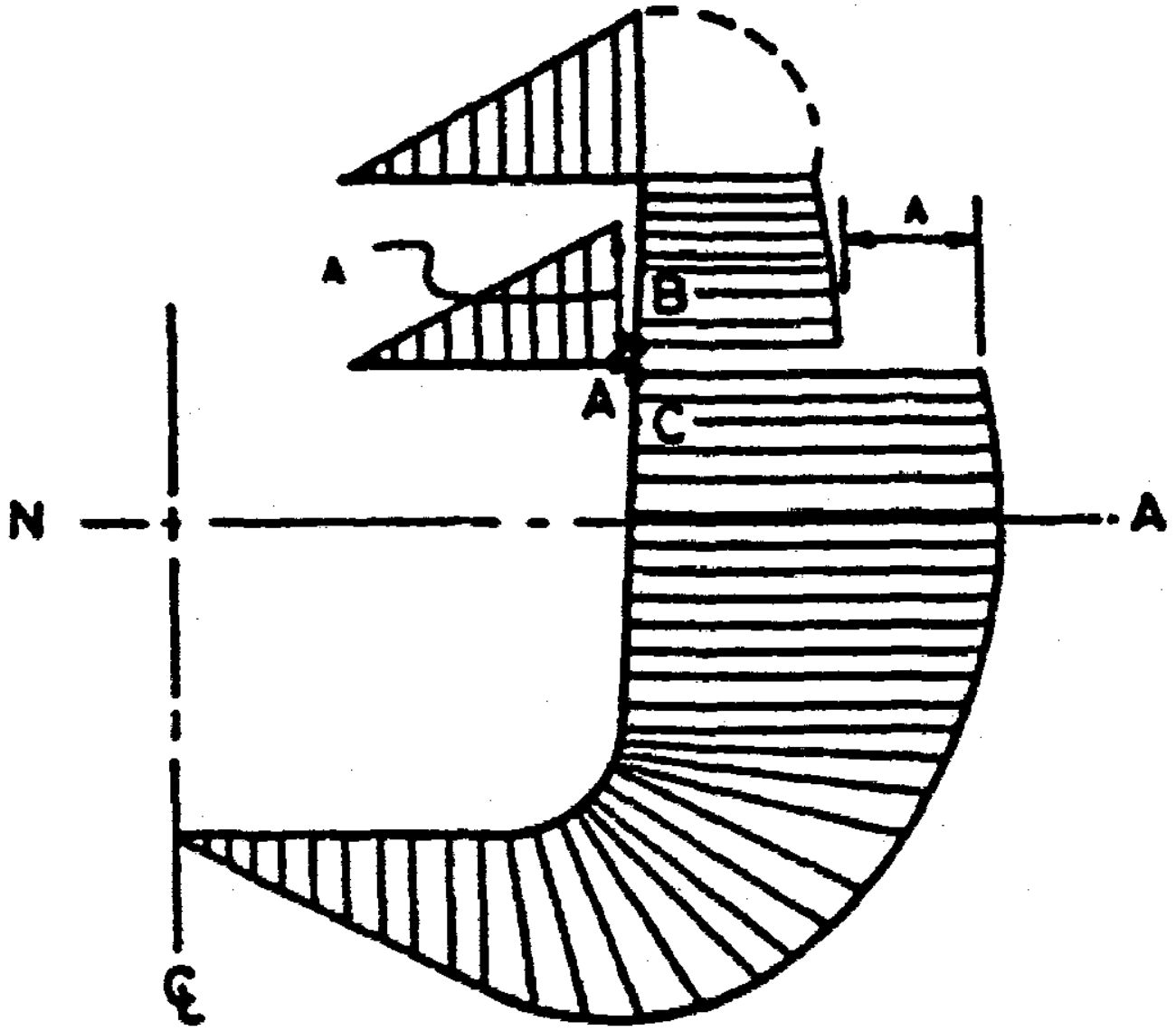
Conservation of shear flow at corners and branch points



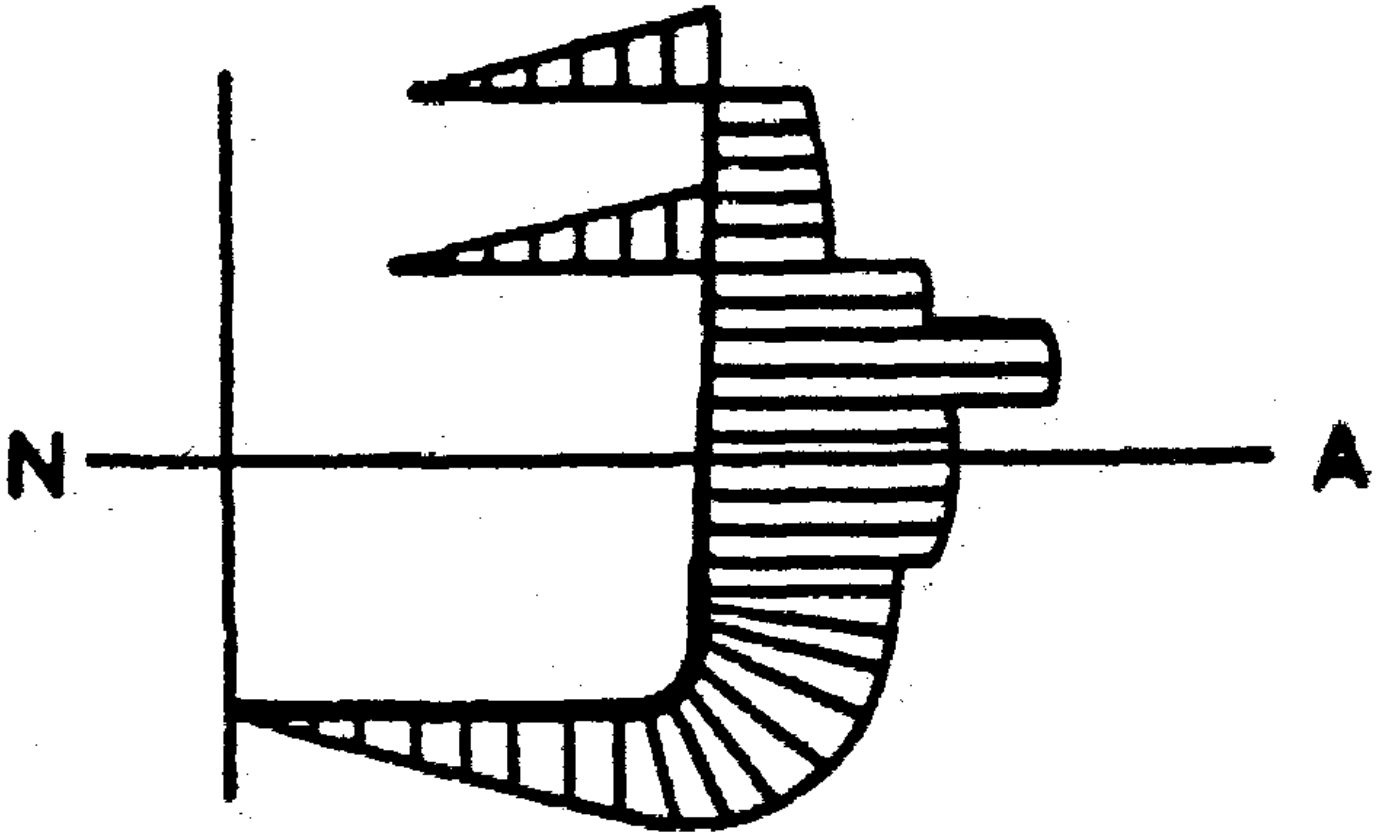
Change of τ due to change of thickness



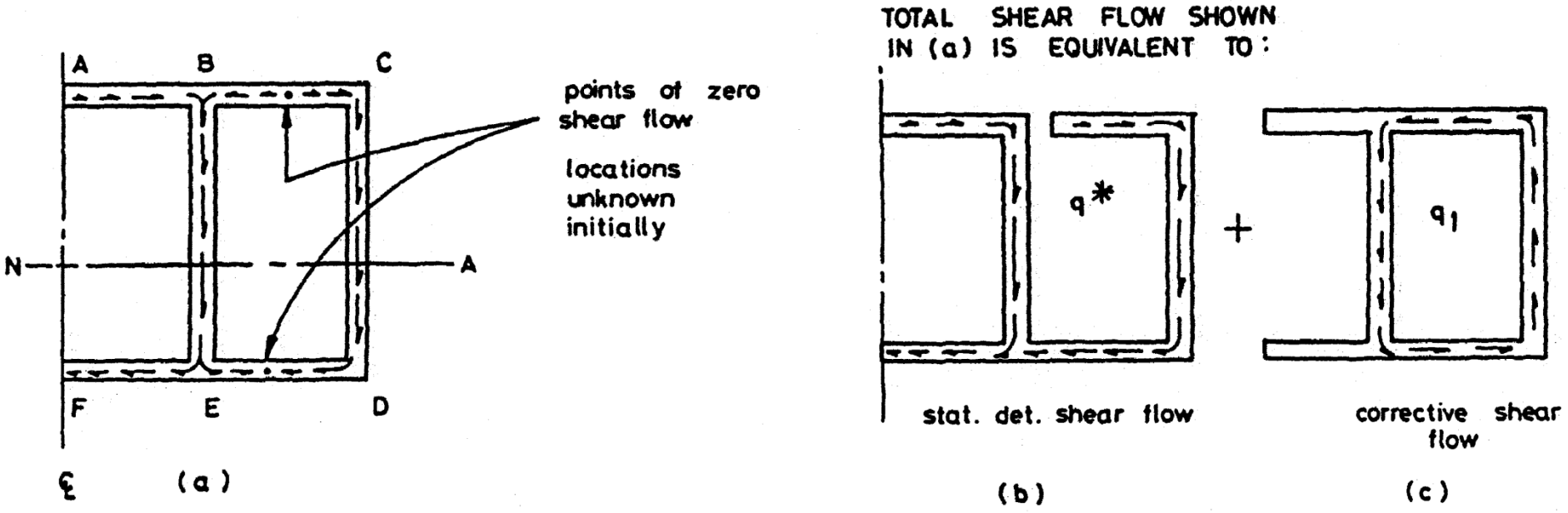
Sample diagram indicating direction of shear flow



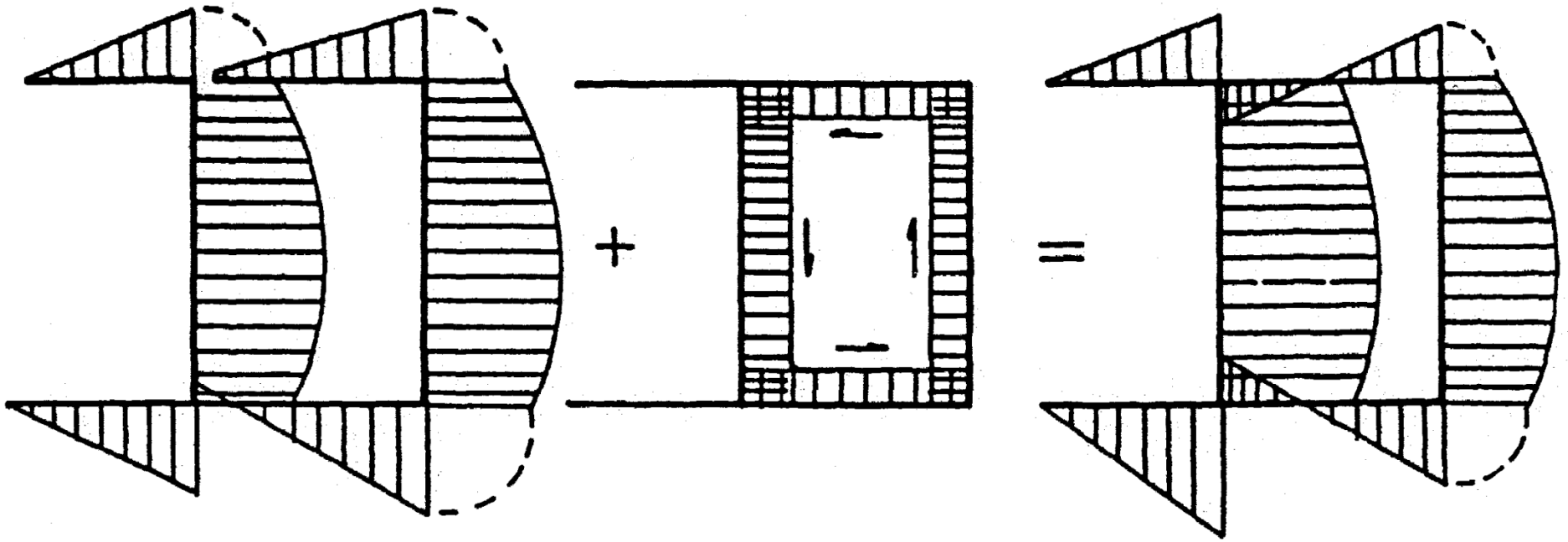
Conservation of shear flow at corners and branch points



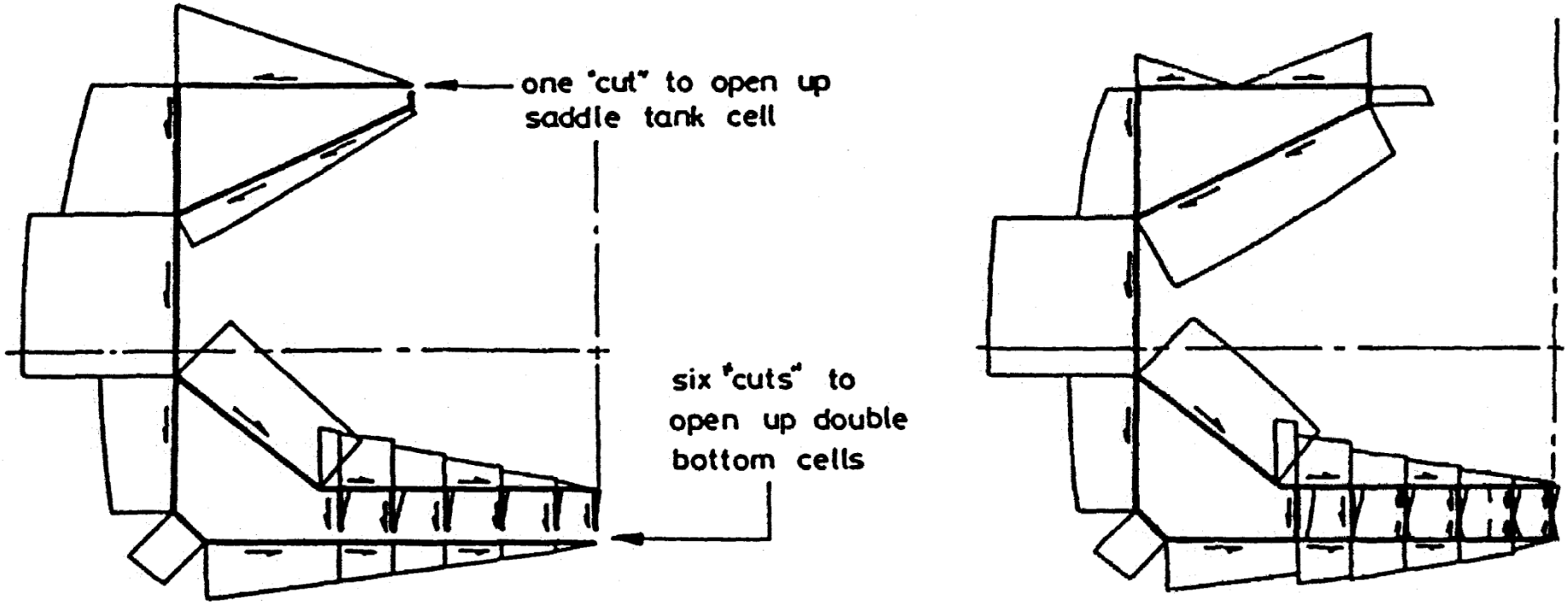
Change of τ due to change of thickness



Calculation of shear flow in multicell sections



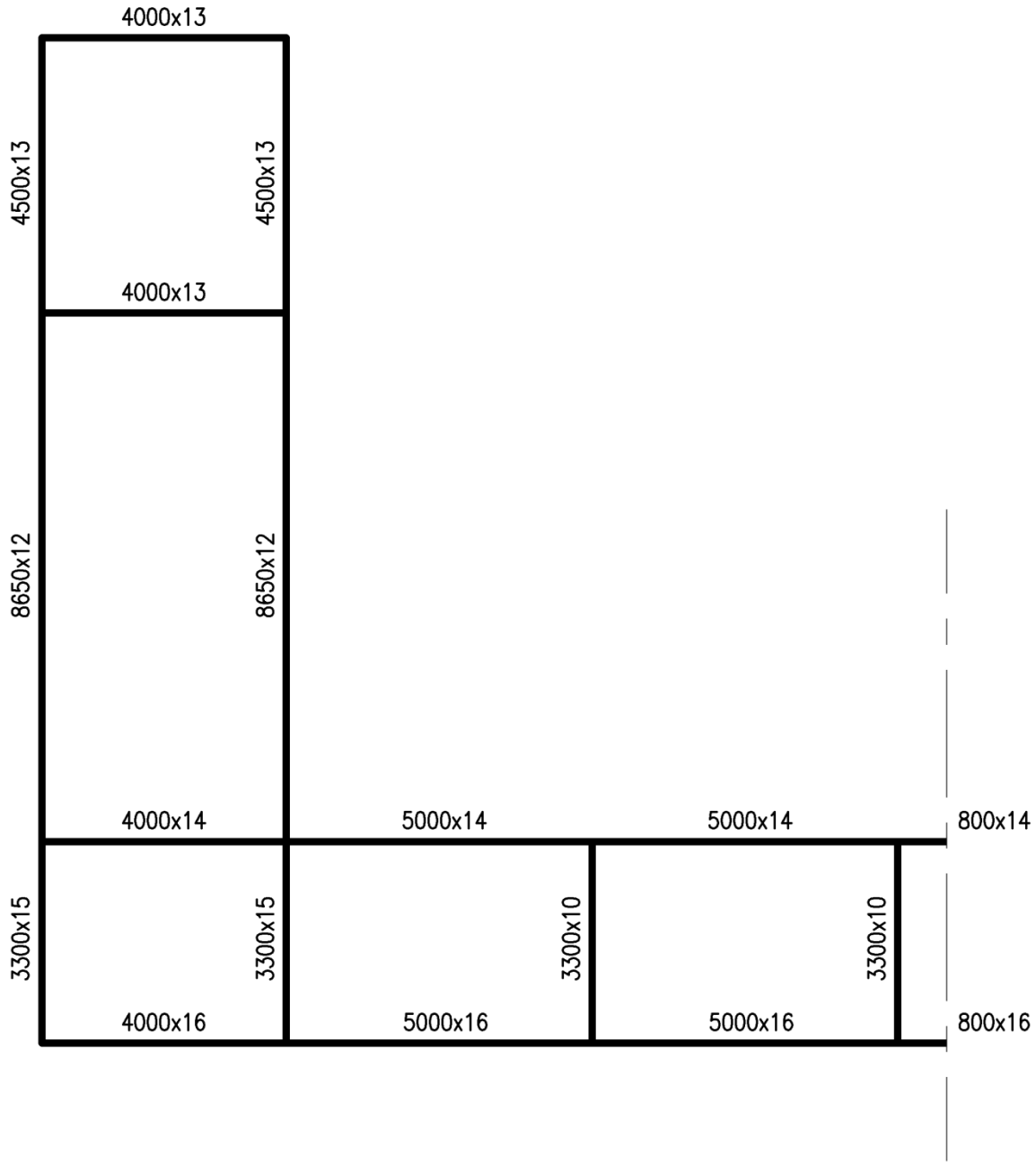
Shear flow in a typical multicelled section (bulk carrier)



(a) STATICALLY DETERMINATE SHEAR FLOW, q^*

(b) ACTUAL SHEAR FLOW

$$
\begin{cases}
\displaystyle\oint_{\text{cell 1}} \frac{q_1}{t}\,ds + \oint_{\text{cell 1}} \frac{q_2}{t}\,ds + \cdots + \oint_{\text{cell 1}} \frac{q_N}{t}\,ds = -\oint_{\text{cell 1}} \frac{q^*}{t}\,ds \\
\displaystyle\oint_{\text{cell 2}} \frac{q_1}{t}\,ds + \oint_{\text{cell 2}} \frac{q_2}{t}\,ds + \cdots + \oint_{\text{cell 2}} \frac{q_N}{t}\,ds = -\oint_{\text{cell 2}} \frac{q^*}{t}\,ds \\
\vdots \\
\displaystyle\oint_{\text{cell } N} \frac{q_1}{t}\,ds + \oint_{\text{cell } N} \frac{q_2}{t}\,ds + \cdots + \oint_{\text{cell } N} \frac{q_N}{t}\,ds = -\oint_{\text{cell } N} \frac{q^*}{t}\,ds
\end{cases}
$$


4000x13
4500x13
4500x13
4000x13
8650x12
8650x12
4000x14
5000x14
5000x14
800x14
3300x15
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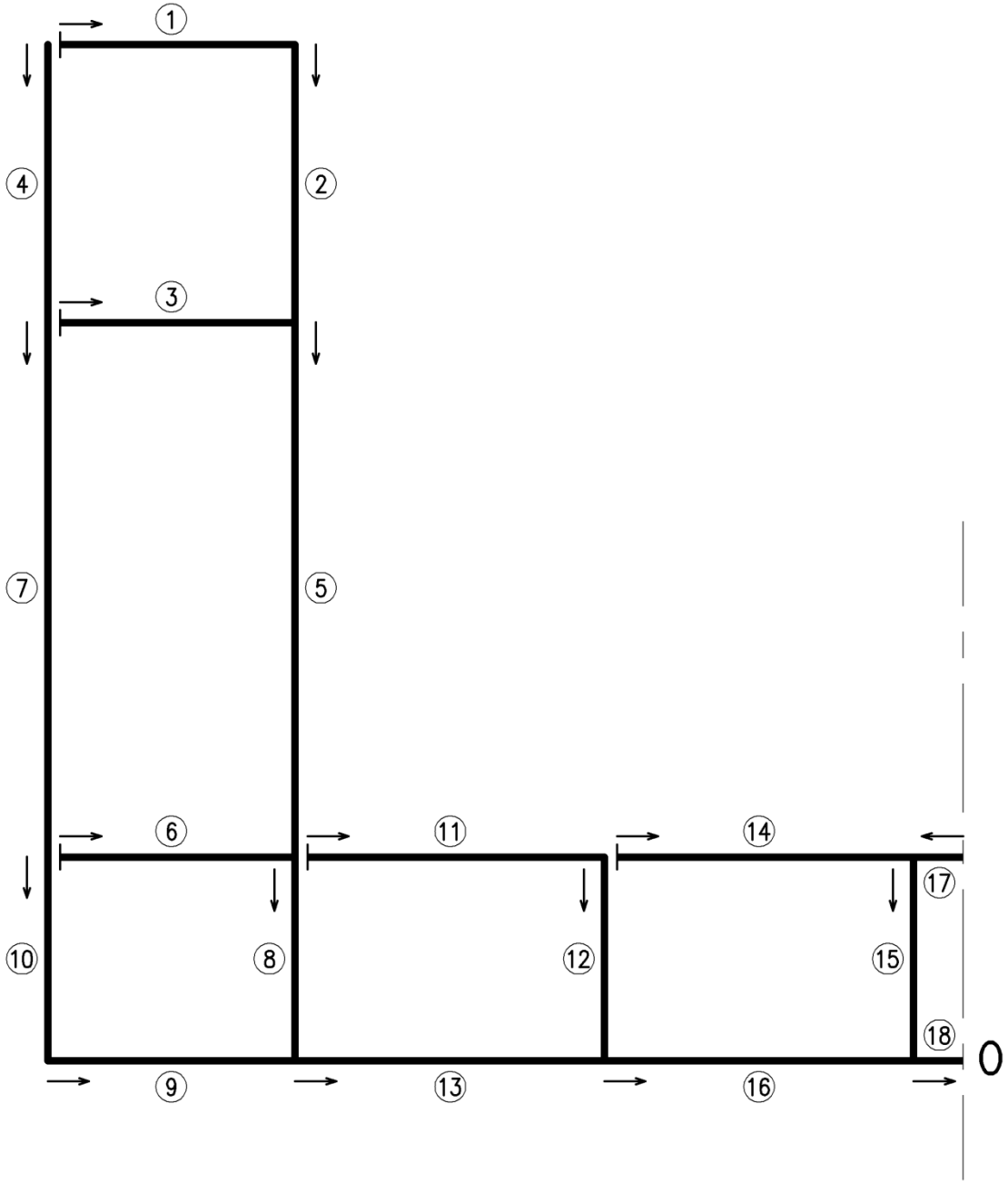
3300x10
3300x10
4000x16
5000x16
5000x16
800x16


①
②
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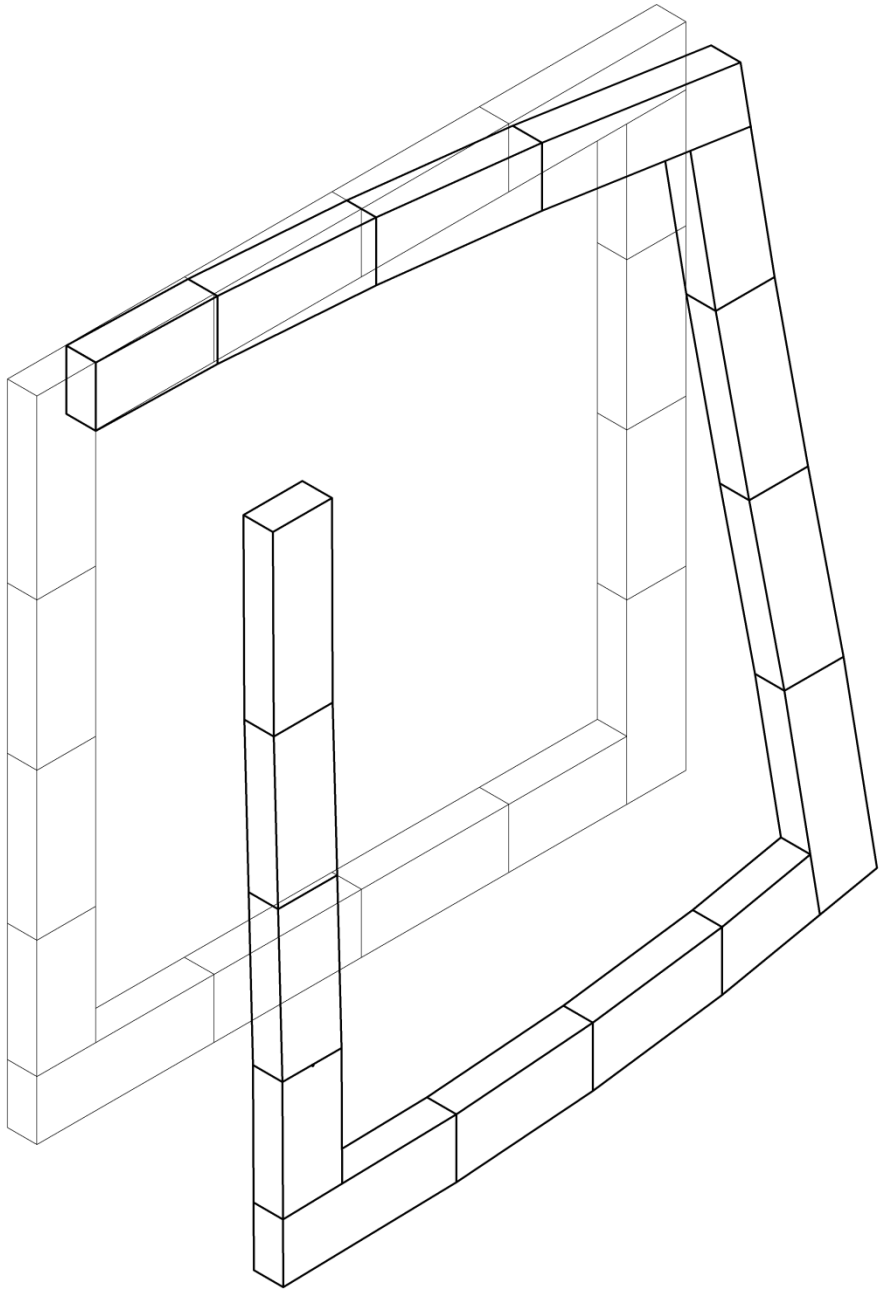
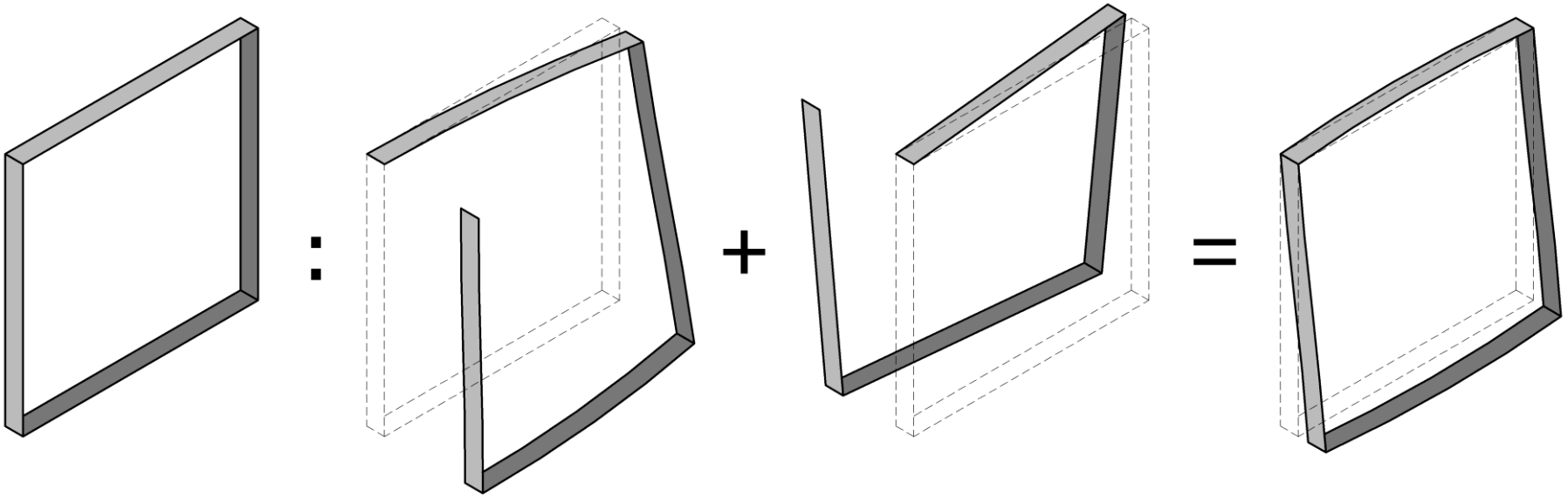
0

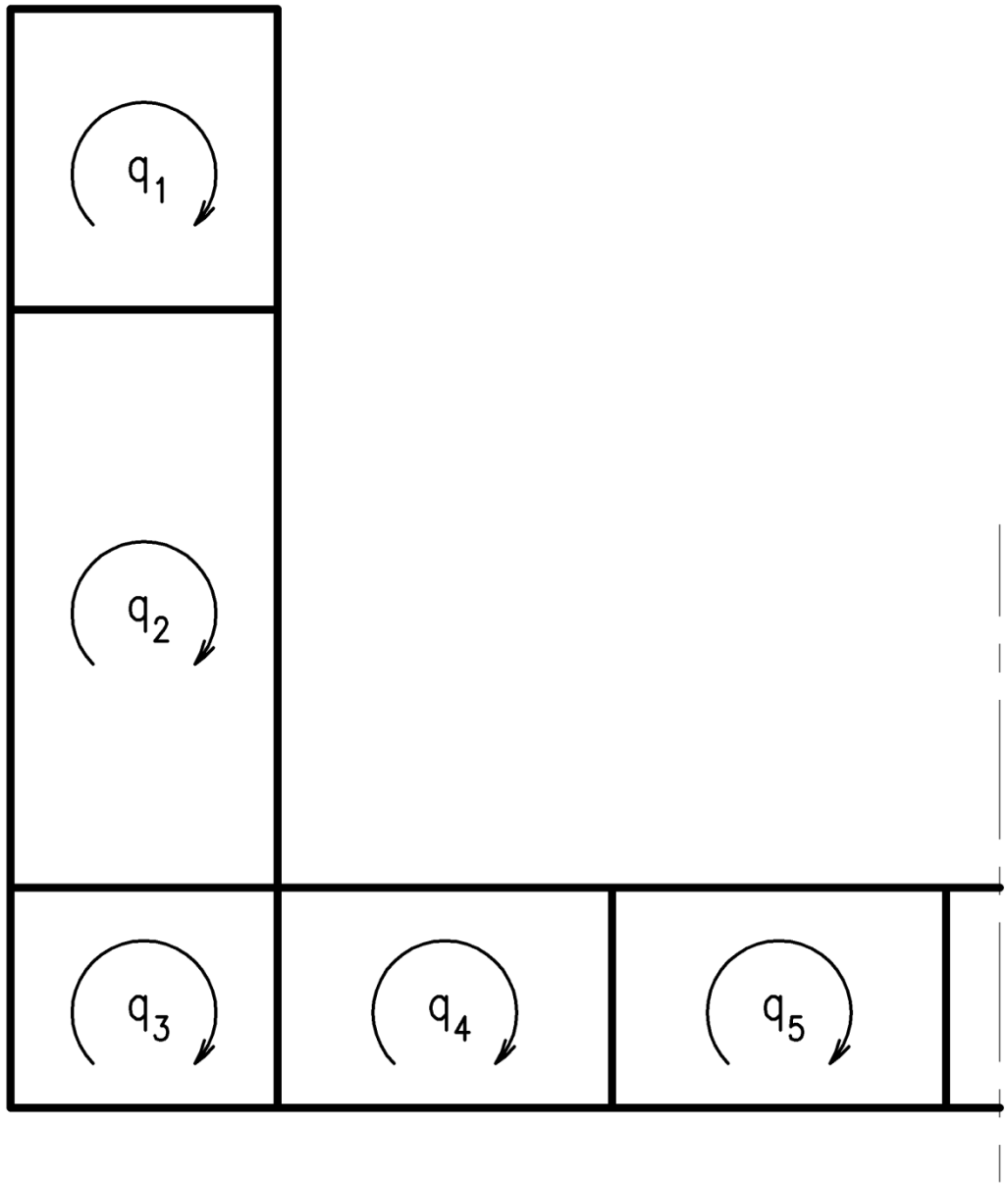


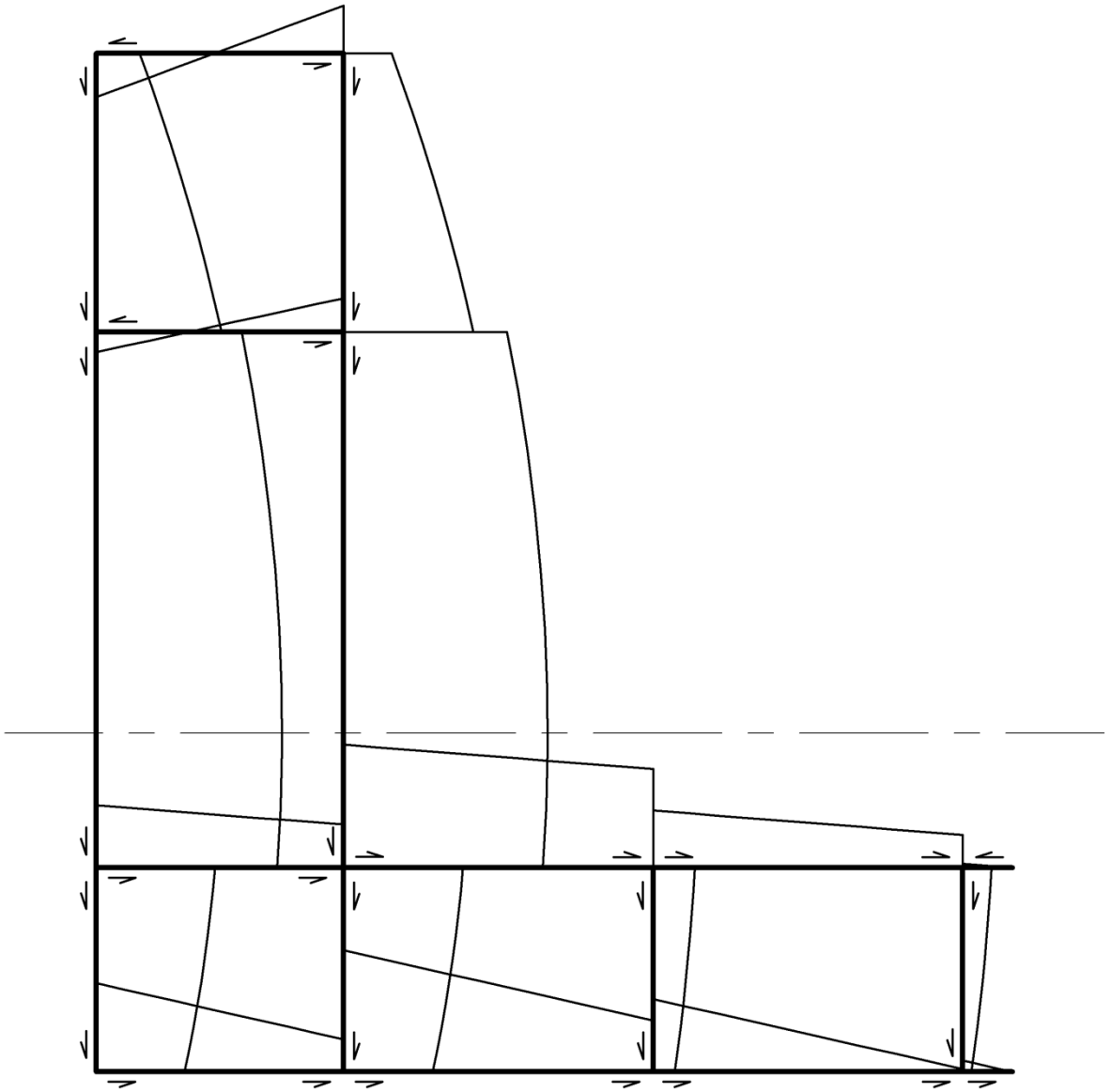


warping dovuto al
flusso isostatico q^*

warping dovuto al
flusso correttivo q_c

warping dovuto al
flusso risultante: $q = q^* + q_c$


q_1
q_2
q_3
q_4
q_5

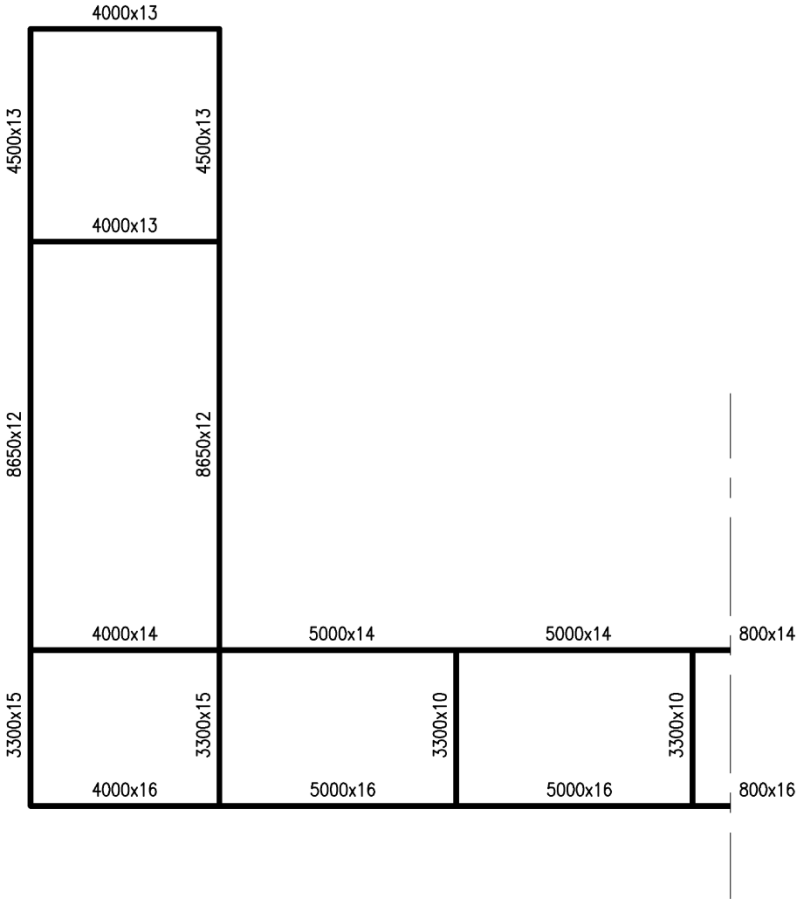


Esercitazione: Calcolo del flusso di taglio

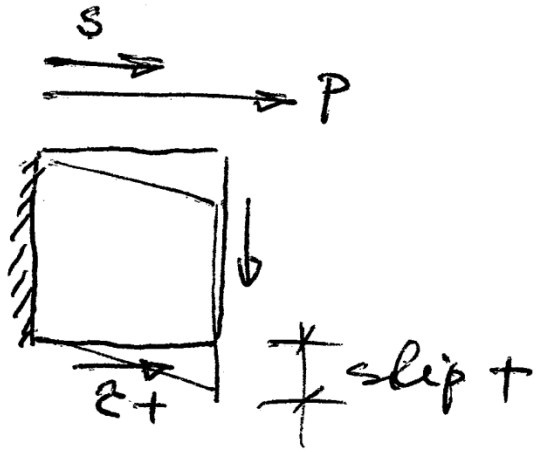
È assegnata la struttura semplificata (con gli elementi longitudinali "spalmati") della sezione trasversale di un bacino galleggiante.

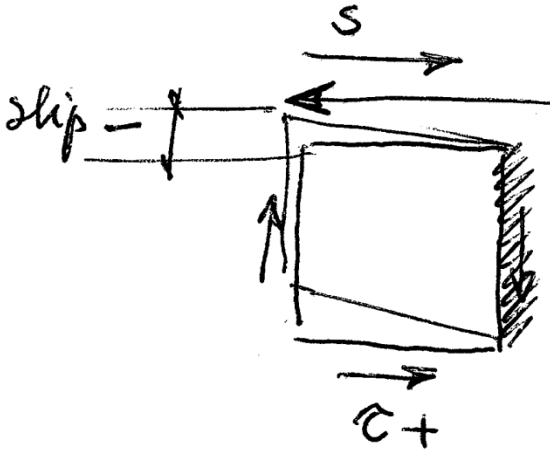
Si determini l'andamento delle tensioni tangenziali da taglio.

Taglio agente sulla sezione T = 1 MN



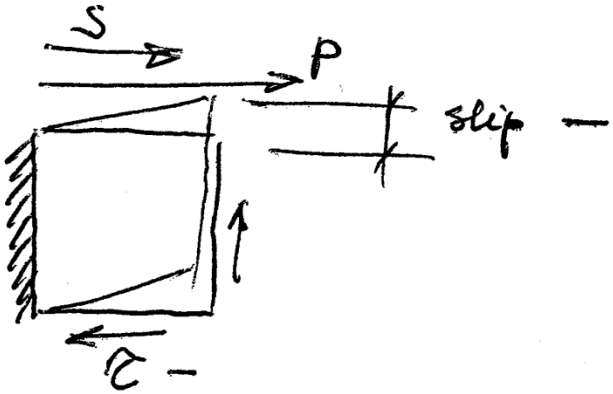
ds +
q* +

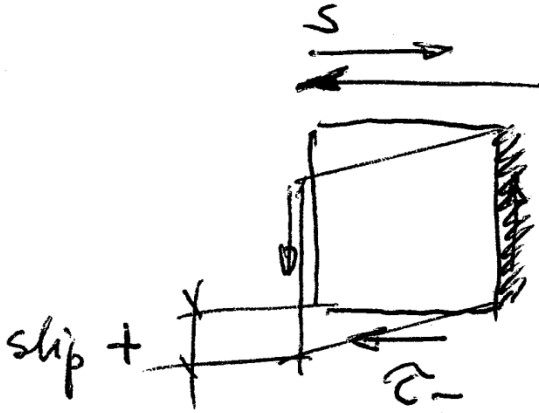




ds −
q* +

ds +
q* −





ds −
q* −

Table 2.4.1. Table of $\int_0^L F_1(x)F_2(x)\,dx$

$F_2(x)$ \ $F_1(x)$	a, L	a, L	a, b, L
c, L	Lac	$\frac{Lac}{2}$	$\frac{Lc(a+b)}{2}$
c, L	$\frac{Lac}{2}$	$\frac{Lac}{3}$	$\frac{Lc(2a+b)}{6}$
c, L	$\frac{Lac}{2}$	$\frac{Lac}{6}$	$\frac{Lc(a+2b)}{6}$
c, d, L	$\frac{La(c+d)}{2}$	$\frac{La(2c+d)}{6}$	$\frac{La(2c+d)+Lb(c+2d)}{6}$
Parabolic: c, d, e; $\frac{L}{2}$, $\frac{L}{2}$	$\frac{La(c+4d+e)}{6}$	$\frac{La(c+2d)}{6}$	$\frac{La(c+2d)+Lb(2d+e)}{6}$