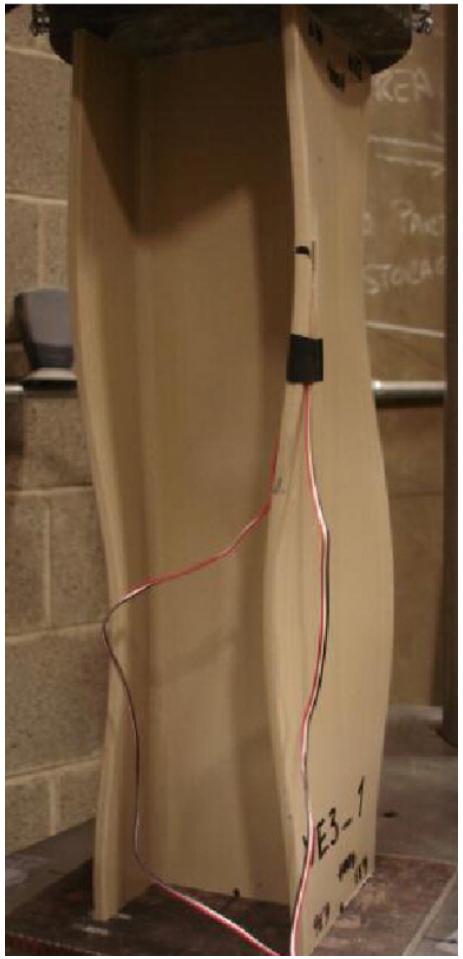
Acero: Abolladura

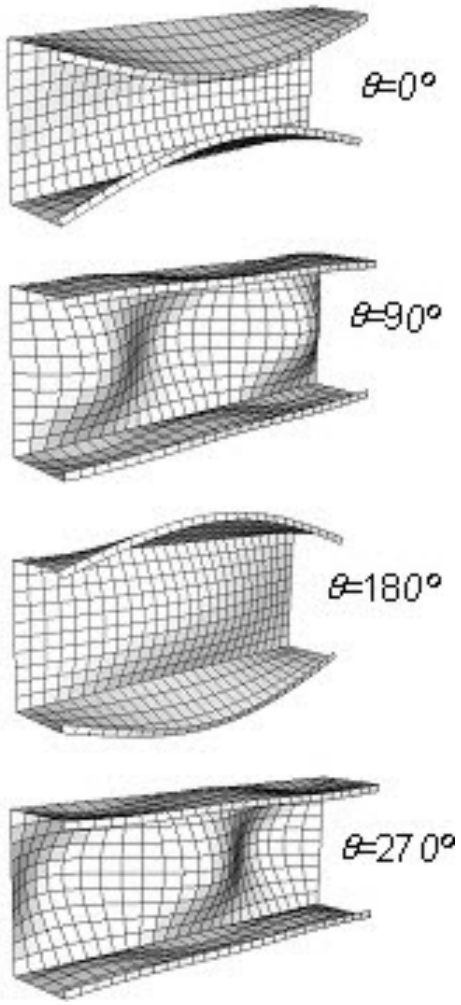
FALLO GLOBAL vs. LOCAL

Fallo global



Fallos locales

FALLO LOCAL

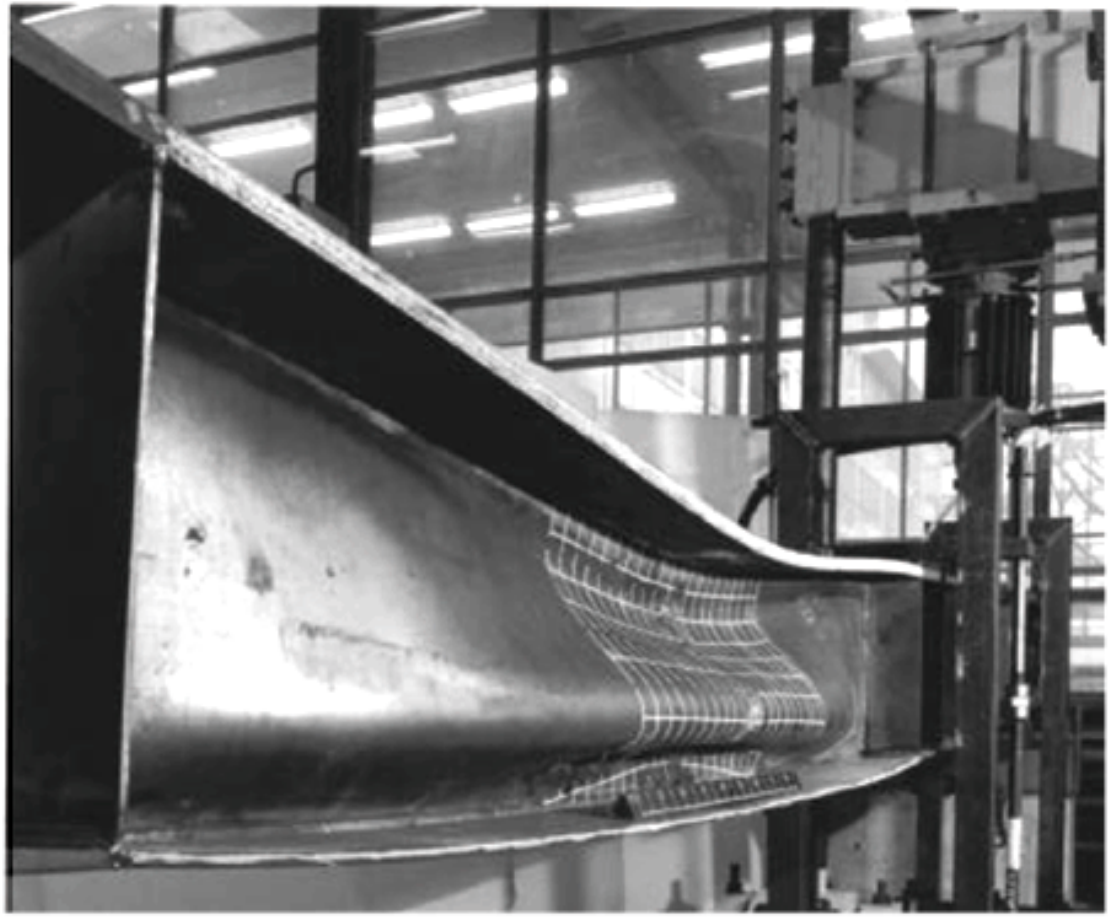


Modos de pandeo local

FALLO LOCAL

Pandeo de chapas

FALLO LOCAL

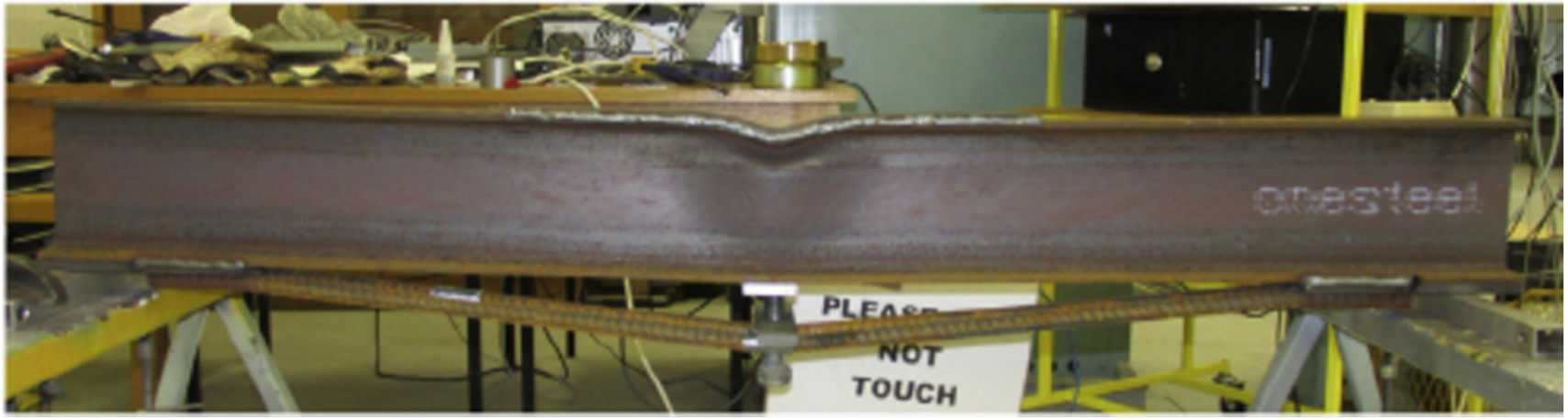


Pandeo de alma

FALLO LOCAL

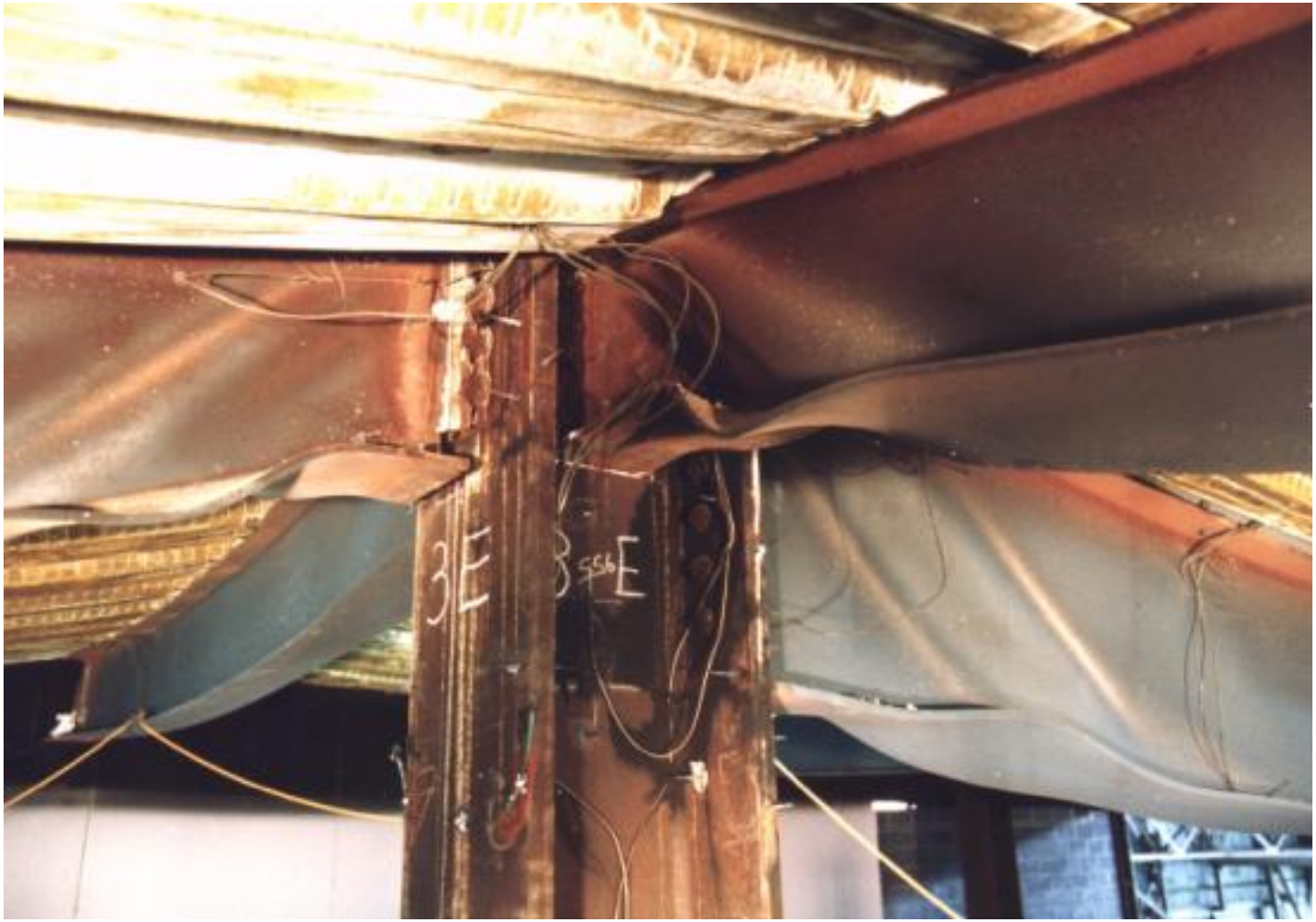
Abolladura por torsión

FALLO LOCAL



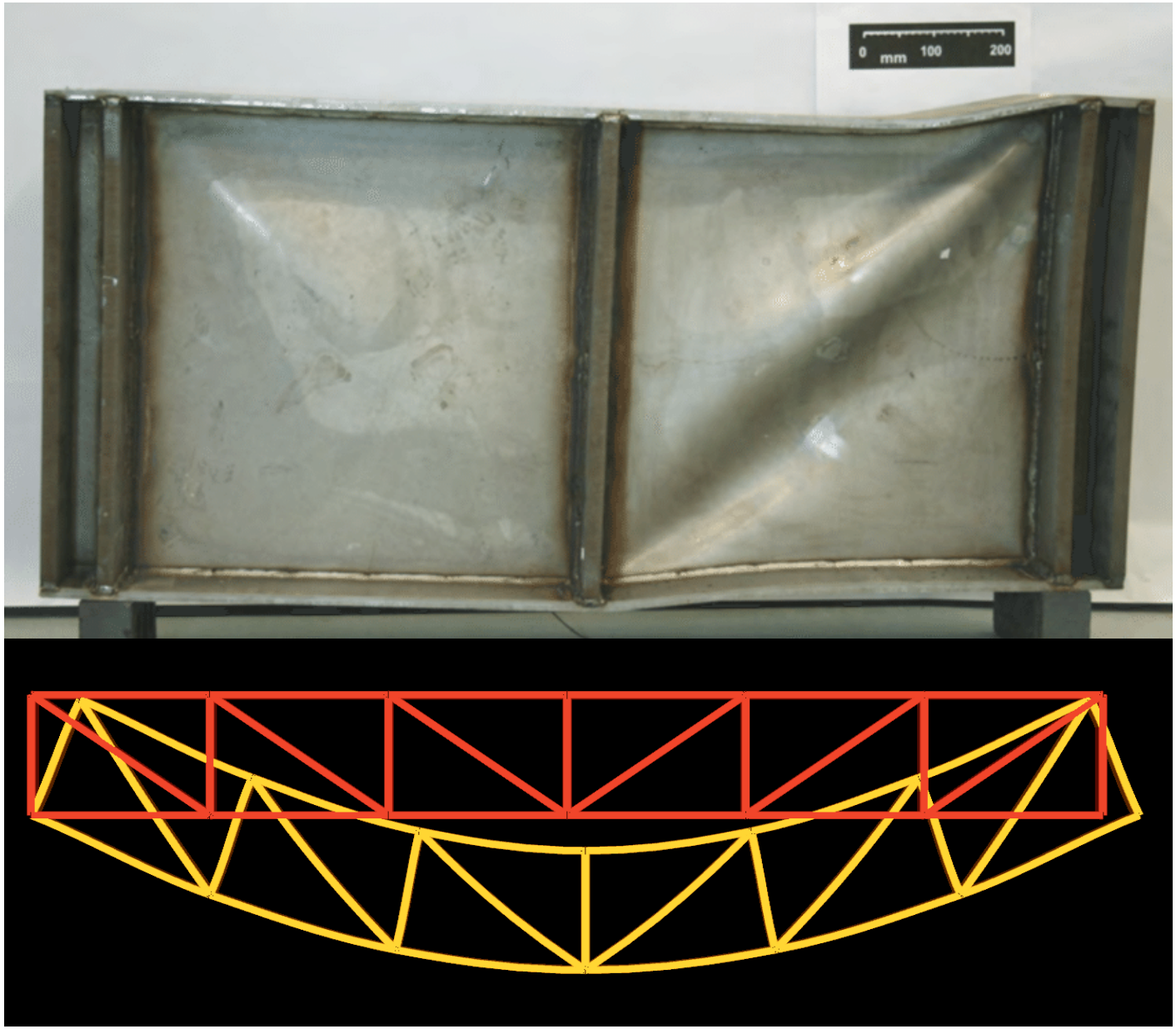
Abolladura por cargas locales

FALLO LOCAL

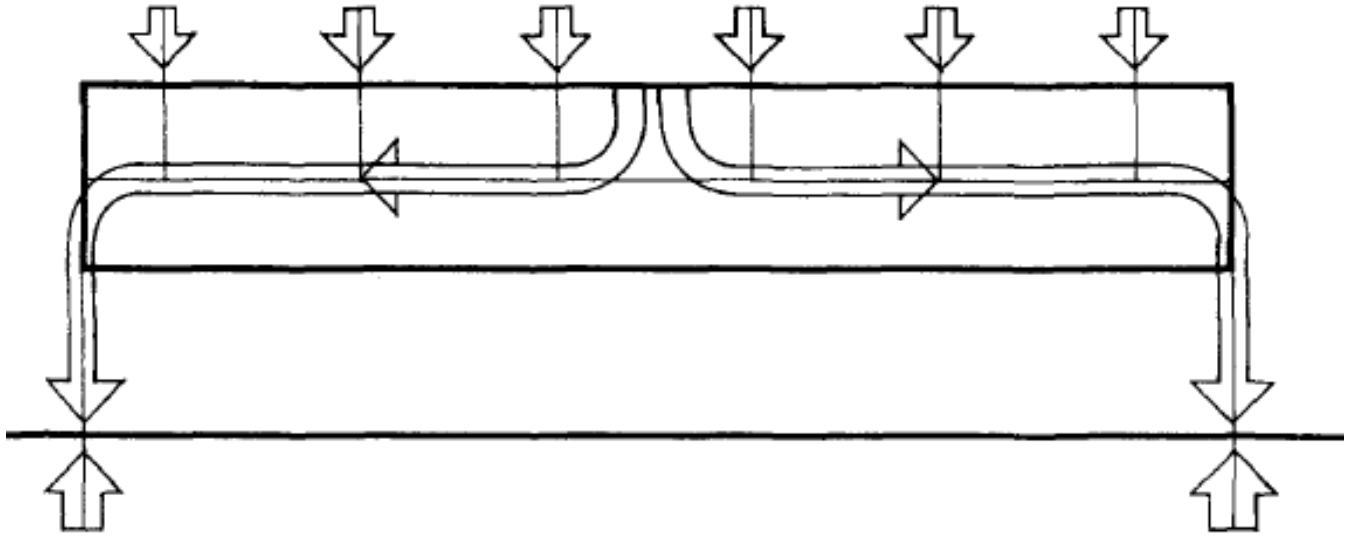


Abolladura del alma a cortante

TENSIONES TANGENCIALES

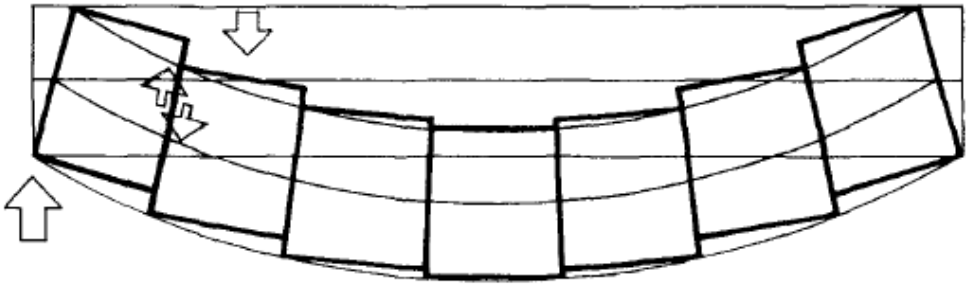


TENSIONES TANGENCIALES



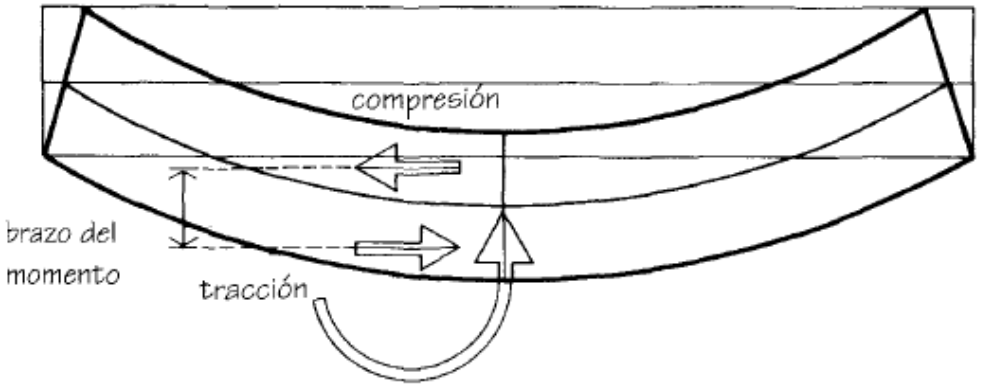
TENSIONES TANGENCIALES

Cortante: tensiones tangenciales

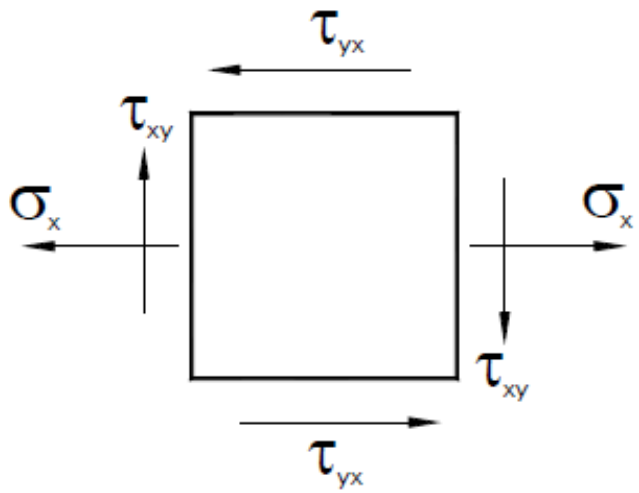


Rasante: tensiones tangenciales

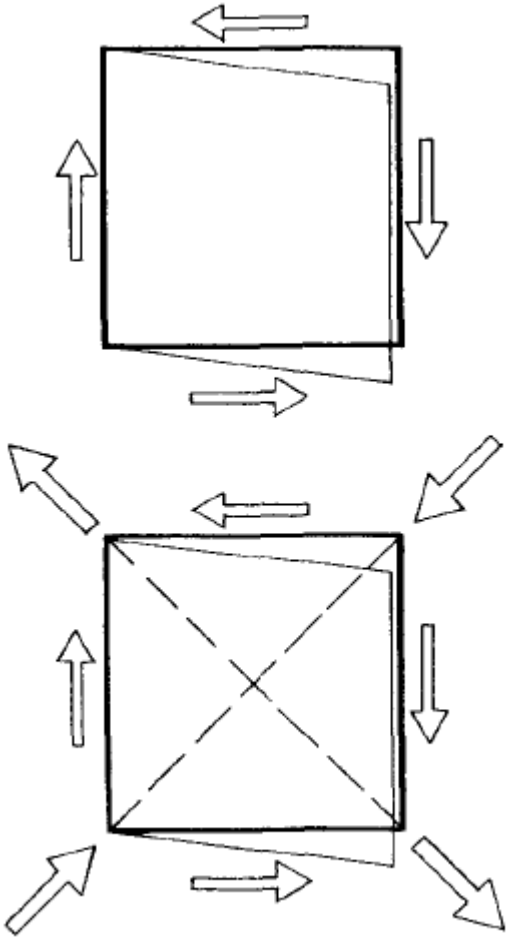
Momento flector: tensiones normales



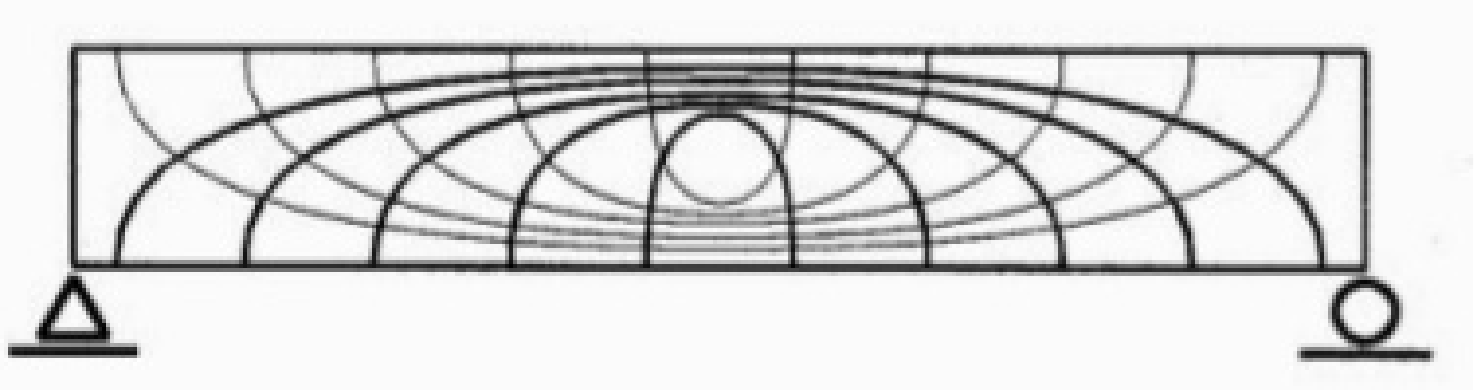
TENSIONES TANGENCIALES



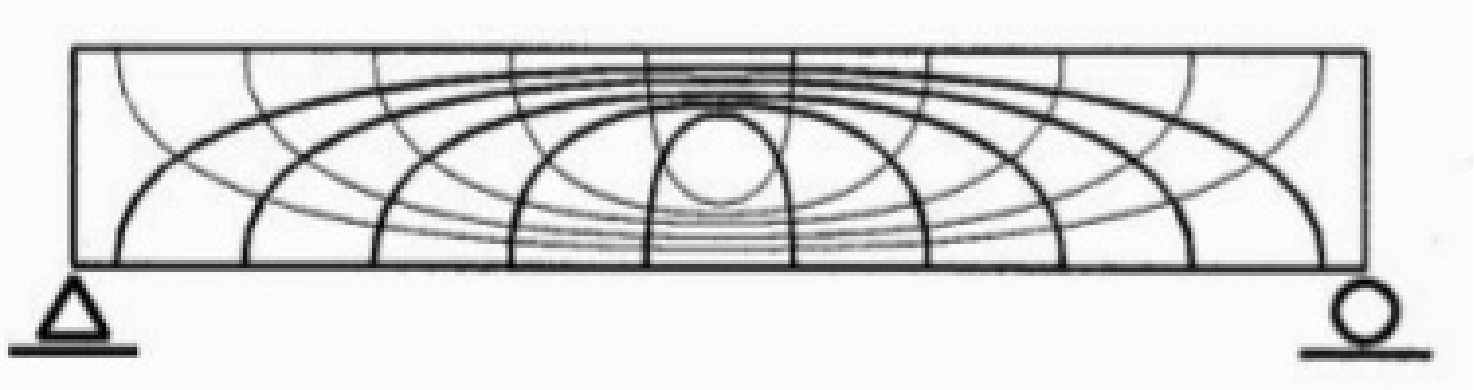
5-2 Tensiones en un elemento plano



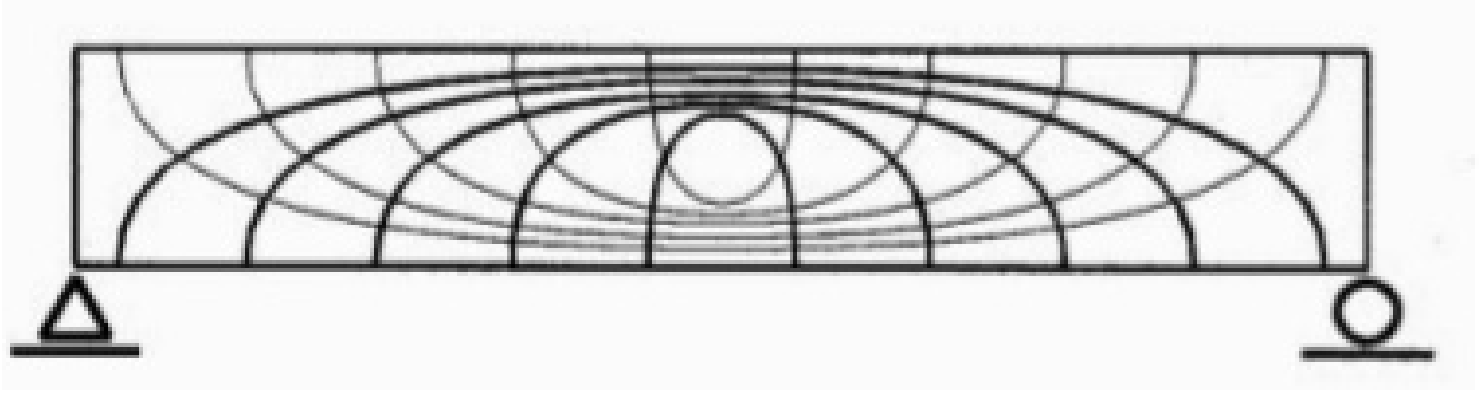
TENSIONES TANGENCIALES



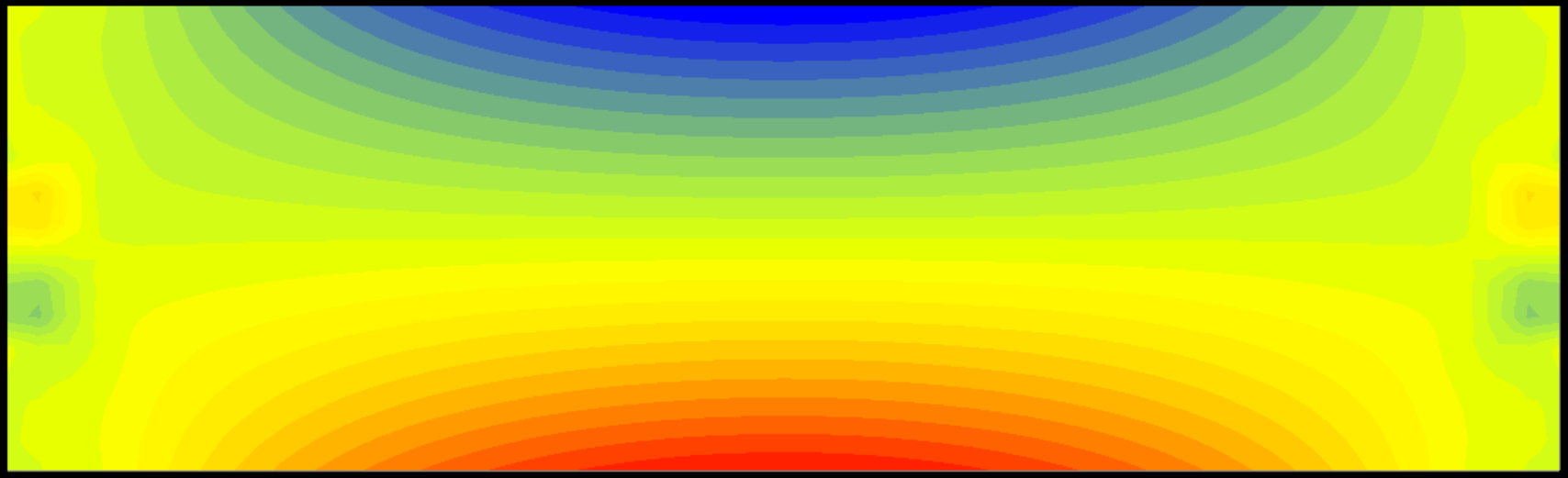
TENSIONES TANGENCIALES



TENSIONES TANGENCIALES



TENSIONES TANGENCIALES



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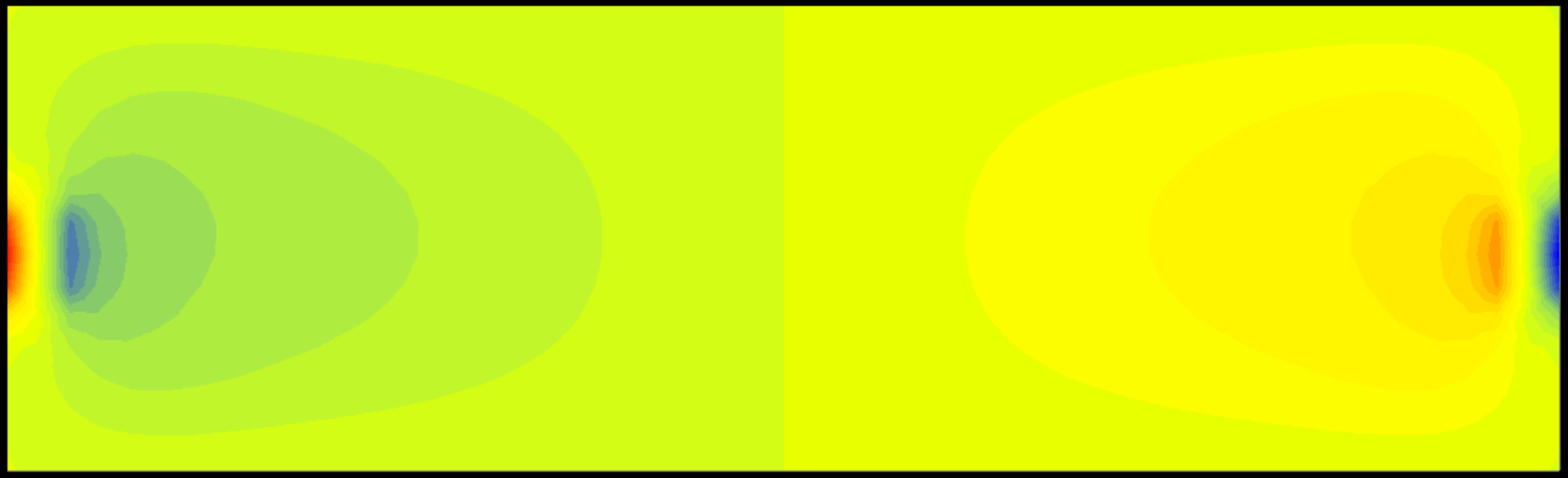
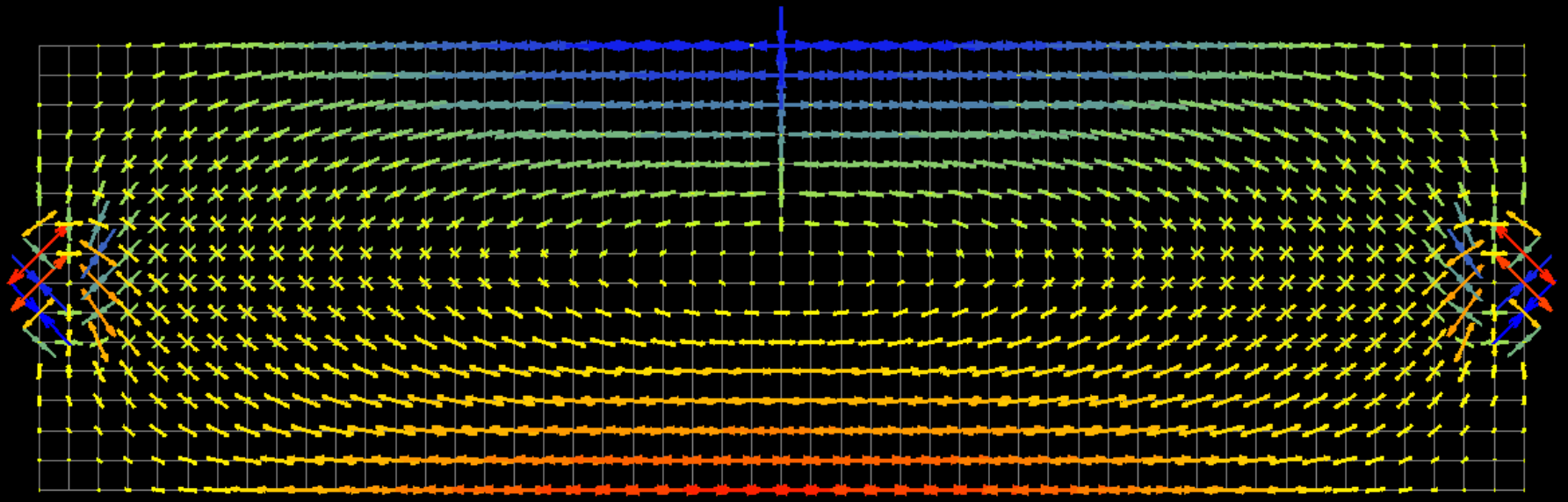
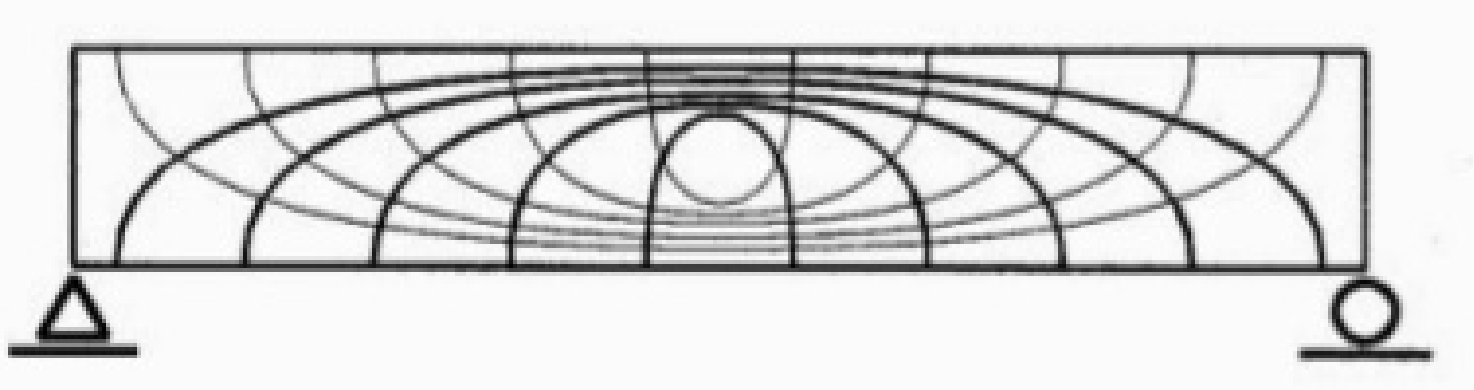


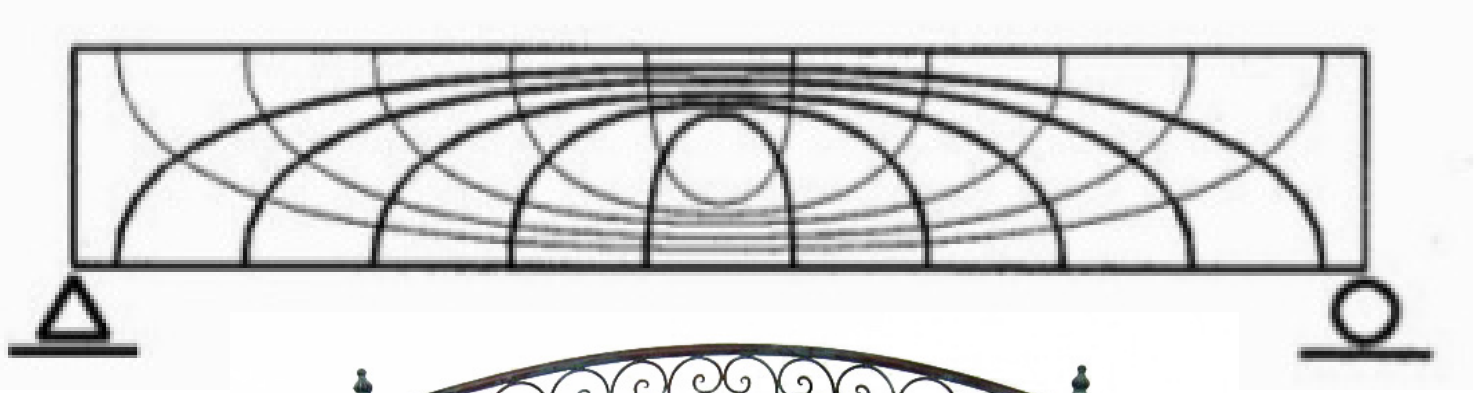
TENSIONES TANGENCIALES



TENSIONES TANGENCIALES

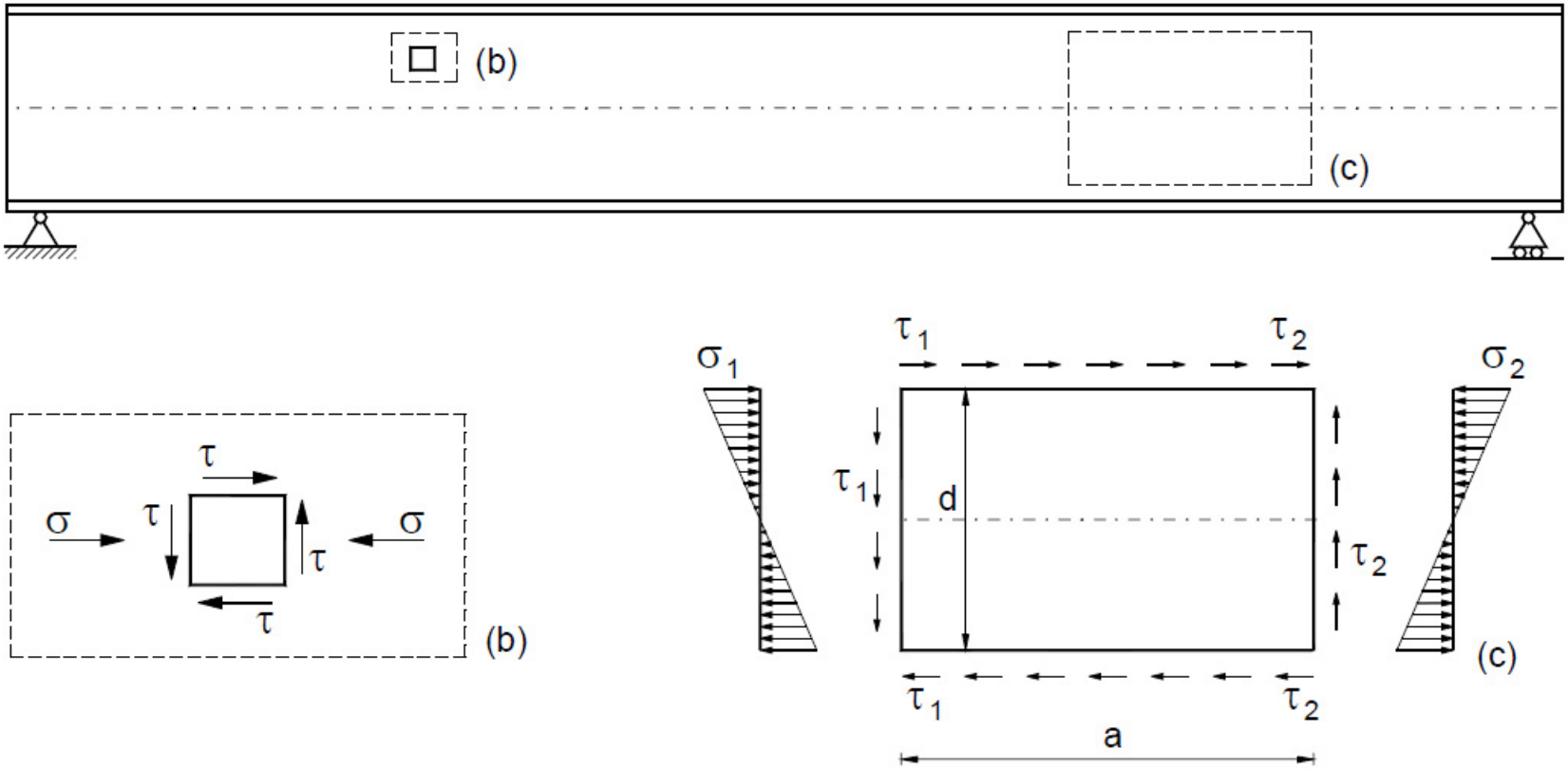


TENSIONES TANGENCIALES



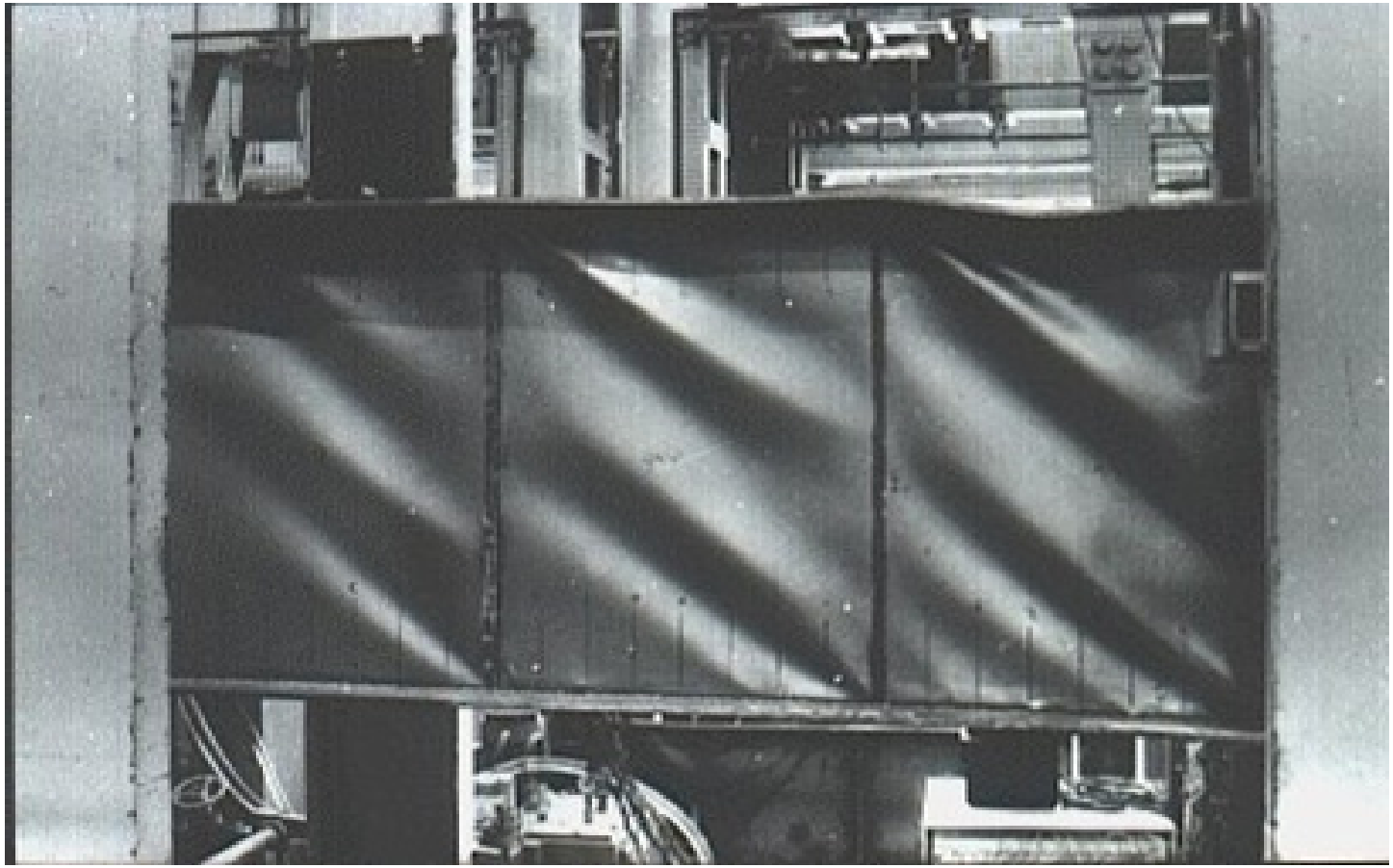
TENSIONES TANGENCIALES

TENSIONES TANGENCIALES



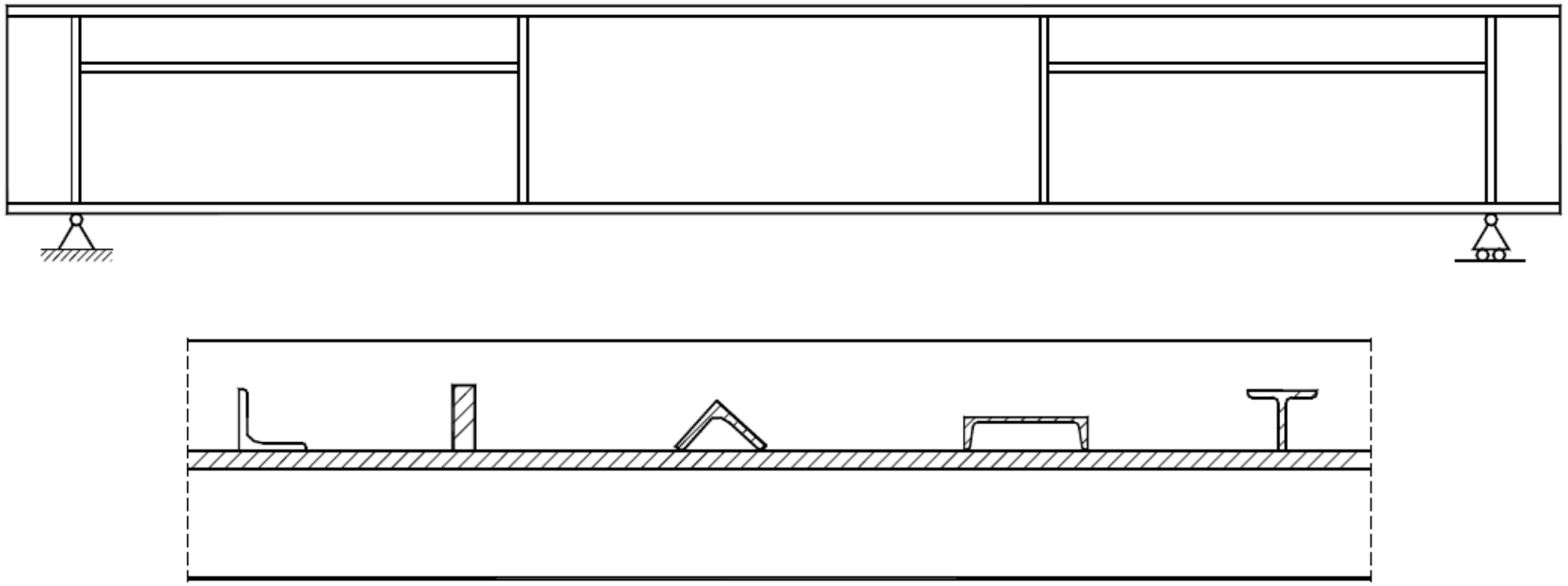
Abolladura del alma a cortante

TENSIONES TANGENCIALES



Abolladura del alma a cortante

TENSIONES TANGENCIALES



Rigidizadores de alma

COMPROBACIONES ACERO

1. <u>ELU</u>

1.1 Resistencia
- Axil
- Momento(s)
- Cortante(s)
- Torsión

1.2 Inestabilidad
- Pandeo
- Pandeo lateral

1.3 Efectos locales
- Abolladura
- Cargas concentradas

2. <u>ELS</u>

2.1 Deformación
- Flecha
- Horizontal

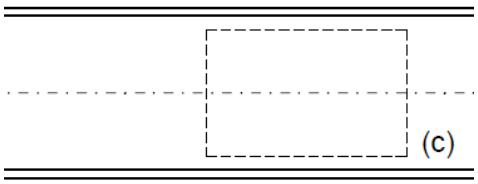
2.2 Vibración

3. <u>NUDOS</u>

3.1 Uniones

3.2 Comprobación local

ABOLLADURA DEL ALMA A CORTANTE

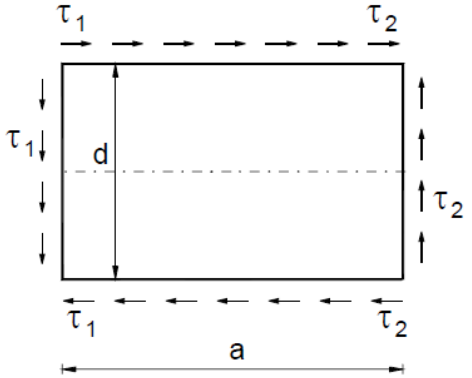


Requisitos para no comprobar abolladura (§6.3.3.4.1):

A) Alma sin rigidizadores

$$d / t_w \leq 70 \cdot \varepsilon$$

$$\varepsilon = \sqrt{235 / f_y}$$



B) Alma con rigidizadores

$$d / t_w \leq 30 \cdot \varepsilon \cdot \sqrt{k_\tau}$$

- Rigidizadores sólo en apoyos: $k_\tau = 5{,}34$

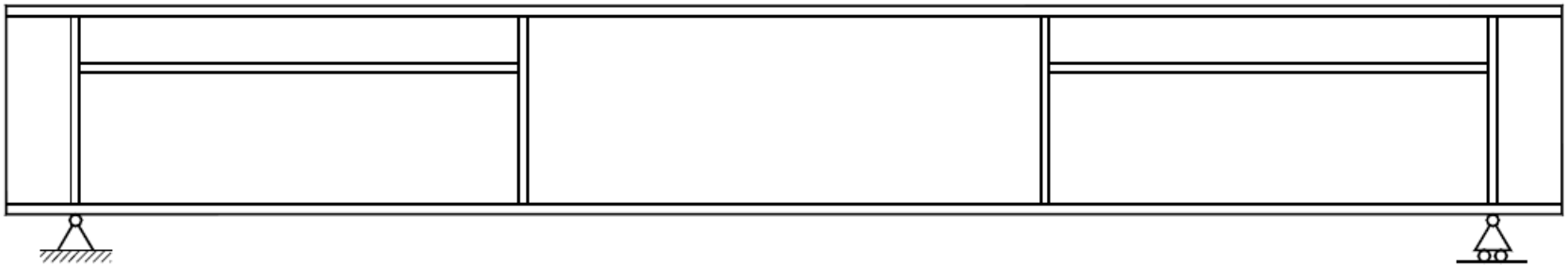
- Rigidizadores también intermedios:

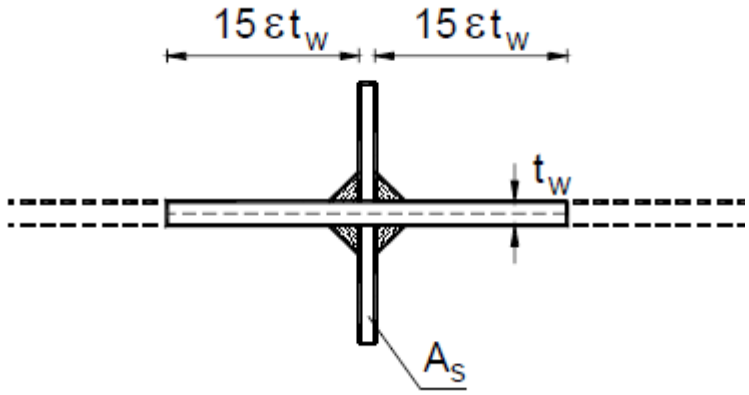
· a < d $\quad k_\tau = 4 + \dfrac{5{,}34}{(a/d)^2}$

· a ≥ d $\quad k_\tau = 5{,}34 + \dfrac{4}{(a/d)^2}$

ABOLLADURA DEL ALMA A CORTANTE

Inercia mínima de rigidizadores (§6.3.3.4.2)



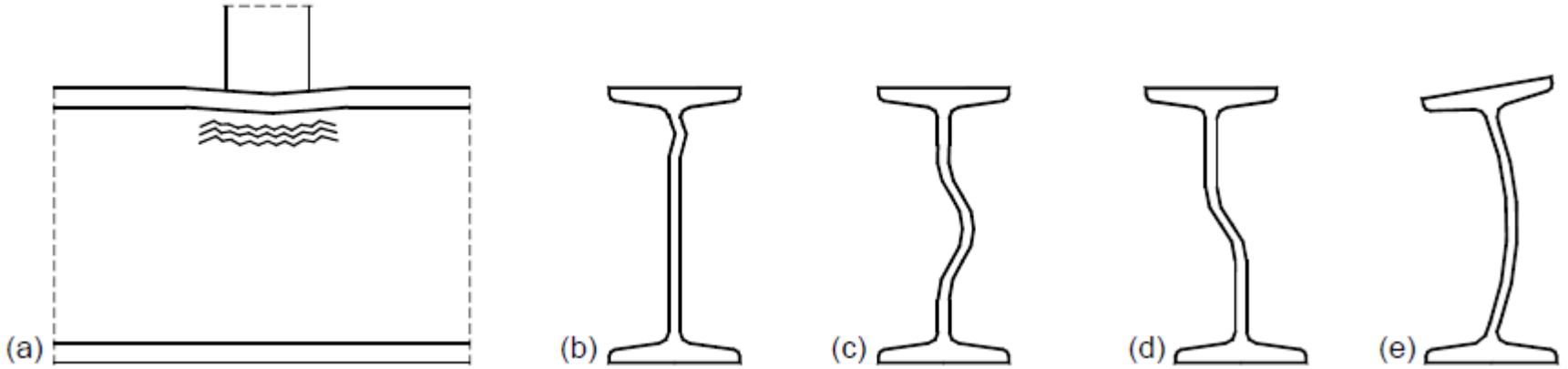


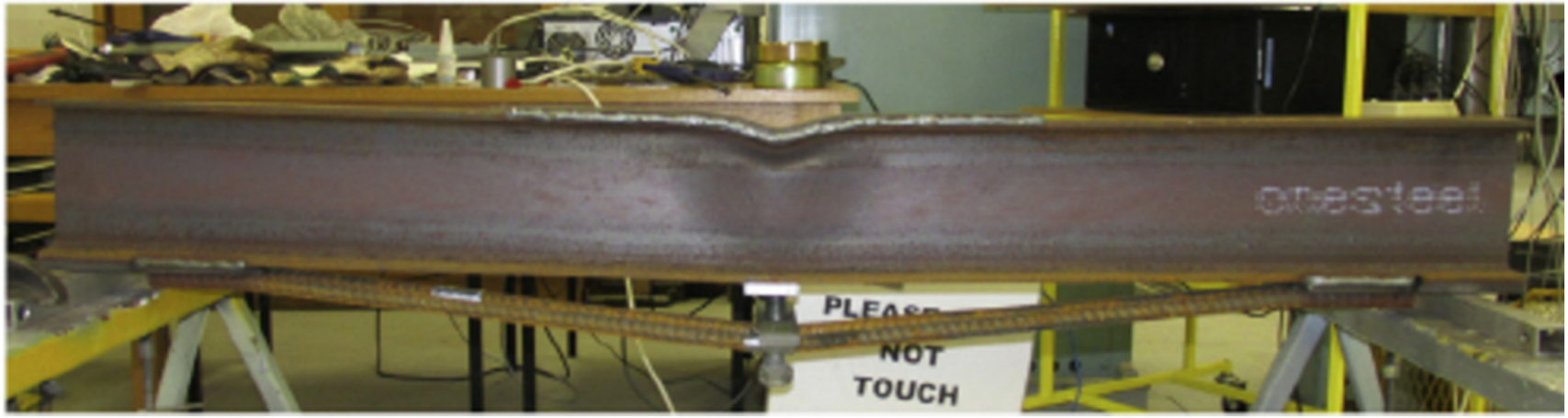
$$\text{si} \quad a/d < \sqrt{2} \quad \Rightarrow \quad I_s \geq 1{,}5 \cdot d^3 \cdot t_w^3 / a^2$$

$$\text{si} \quad a/d \geq \sqrt{2} \quad \Rightarrow \quad I_s \geq 0{,}75 \cdot d \cdot t^3$$

CARGAS CONCENTRADAS

Distintos tipos de fallo

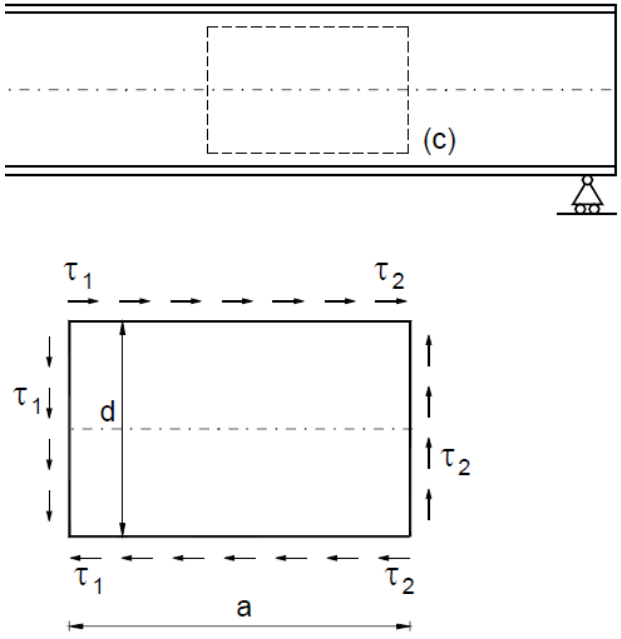


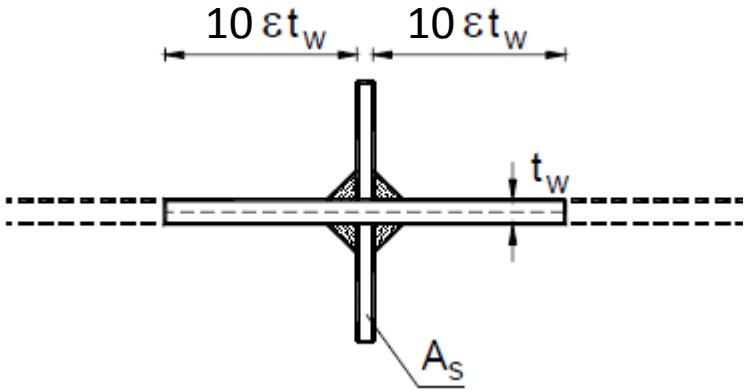


CARGAS CONCENTRADAS

Condición de cumplimiento:

Sección eficaz <u>dimensionada a pandeo</u> en compresión simple con
$L_k = 0.8d$ y curva c
Puede necesitar <u>rigidizadores</u>

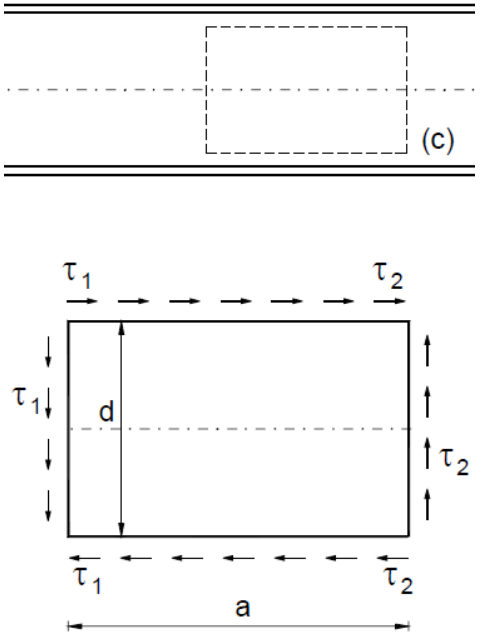


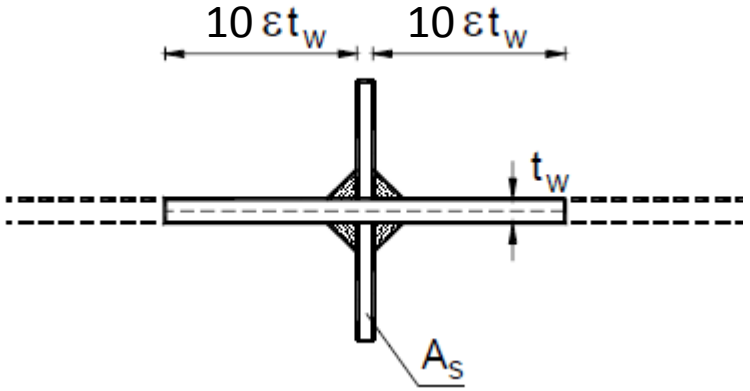


CARGAS CONCENTRADAS

Condición de cumplimiento (§6.3.3.5.1):

Disposición de <u>rigidizadores</u> de alma, con sección eficaz <u>dimensionada a pandeo</u> en compresión simple ante carga concentrada con $L_k = 0.8d$ y curva c





CARGAS CONCENTRADAS