

20° **ENECE**

Encontro Nacional
de Engenharia e
Consultoria Estrutural

A ARTE DA
ENGENHARIA
ESTRUTURAL



EDIFÍCIOS SEM JUNTAS



1. INTRODUÇÃO
2. VANTAGENS E DESVANTAGENS
3. EFEITOS DAS JUNTAS
4. CRITÉRIOS DE PROJETO
5. MODELAGEM
6. DIMENSIONAMENTO
7. EDIFÍCIO GARAGEM DA ARENA ALLIANZ



2. VANTAGENS E DESVANTAGENS



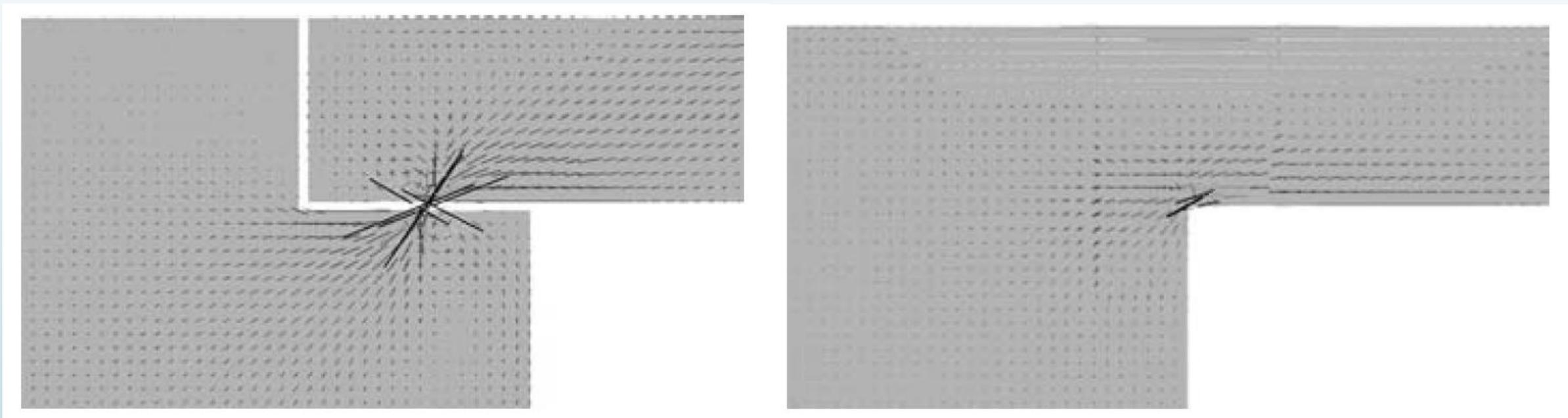
AS JUNTAS

AUMENTAM CUSTOS

TÊM VIDA ÚTIL MENOR

SÃO LOCAIS CRÍTICOS

CRIAM DESCONTINUIDADES





DESVANTAGENS

acréscimo de esforços

a análise deve ser não linear

a interação solo estrutura é importante

o histórico do carregamento é relevante

maiores taxas de armaduras na vigas e lajes



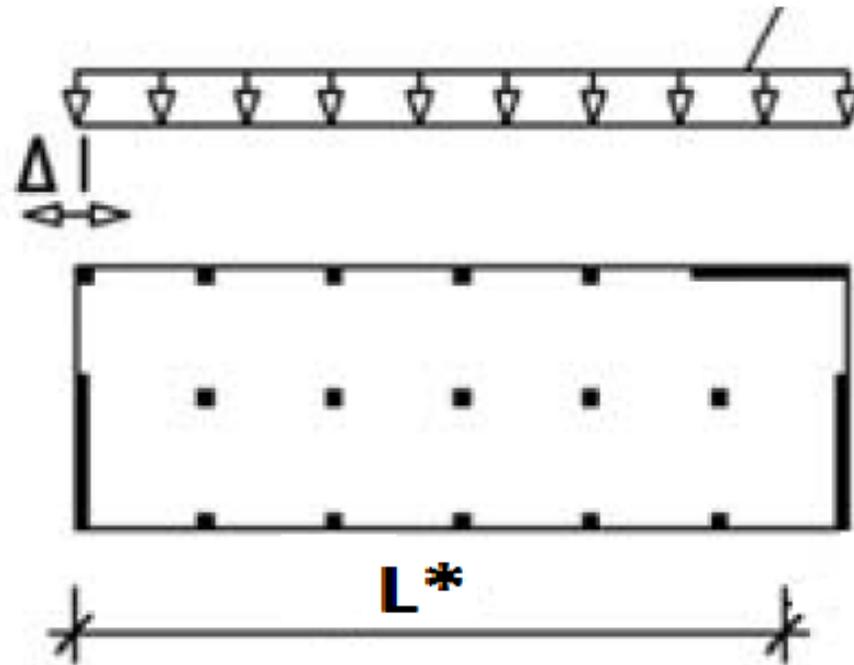
3. EFEITOS DAS JUNTAS



AO CRIAR JUNTAS, GARANTIR PRESENÇA DE
ESTRUTURAS DE CONTRAVENTAMENTO EM TODAS AS
PARTES.



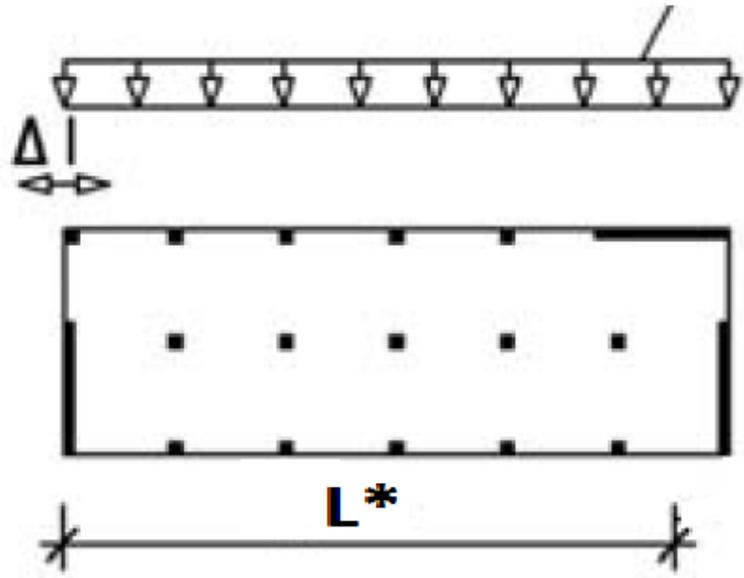
Vento e imperfeições geom.



(a)



Vento e imperfeições geom.



Sem junta

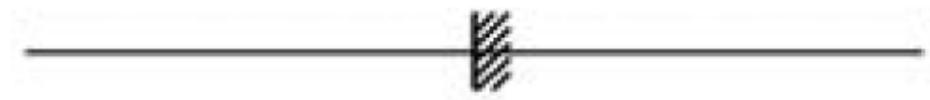
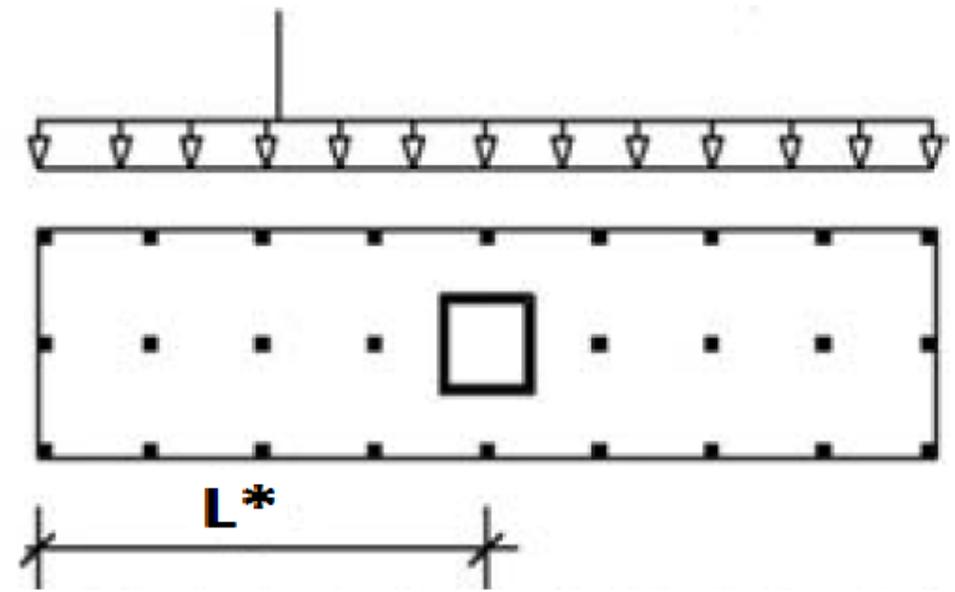


Com junta



(a)

Vento e imperfeições geom.



(b)



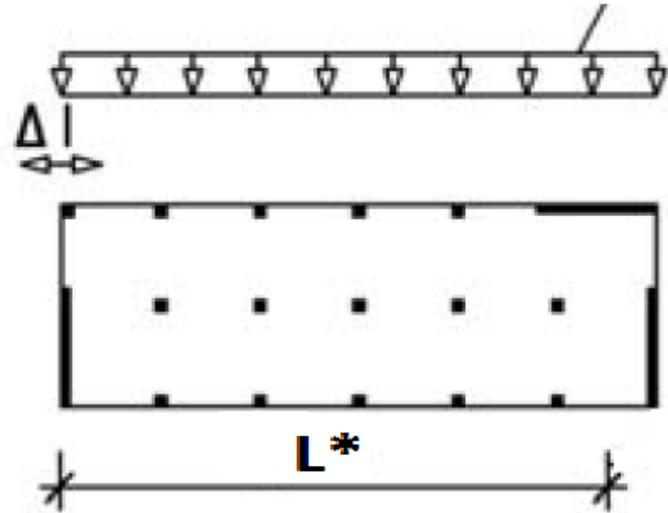
4. CRITÉRIOS DE PROJETO



Quando um edifício deve ter juntas?



Vento e imperfeições geom.



Sem junta

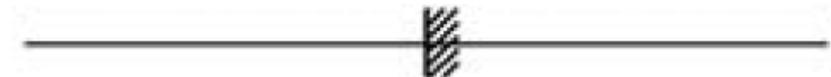
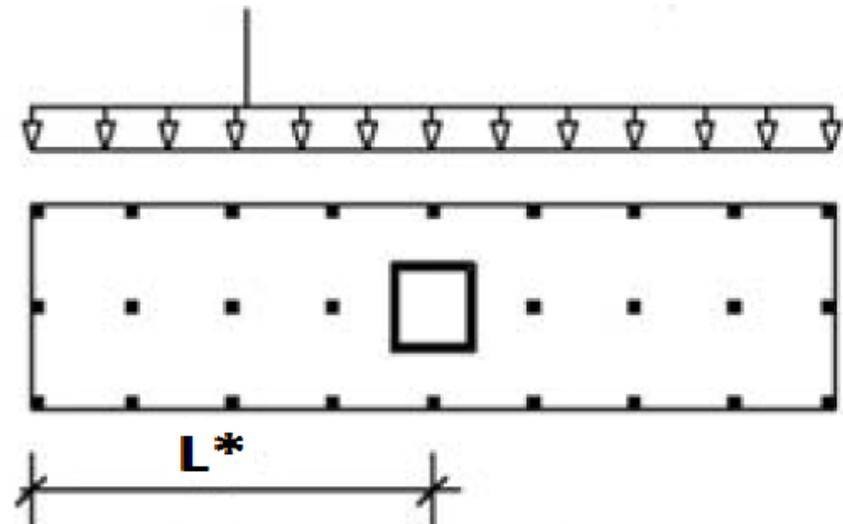


Com junta



(a)

Vento e imperfeições geom.



(b)



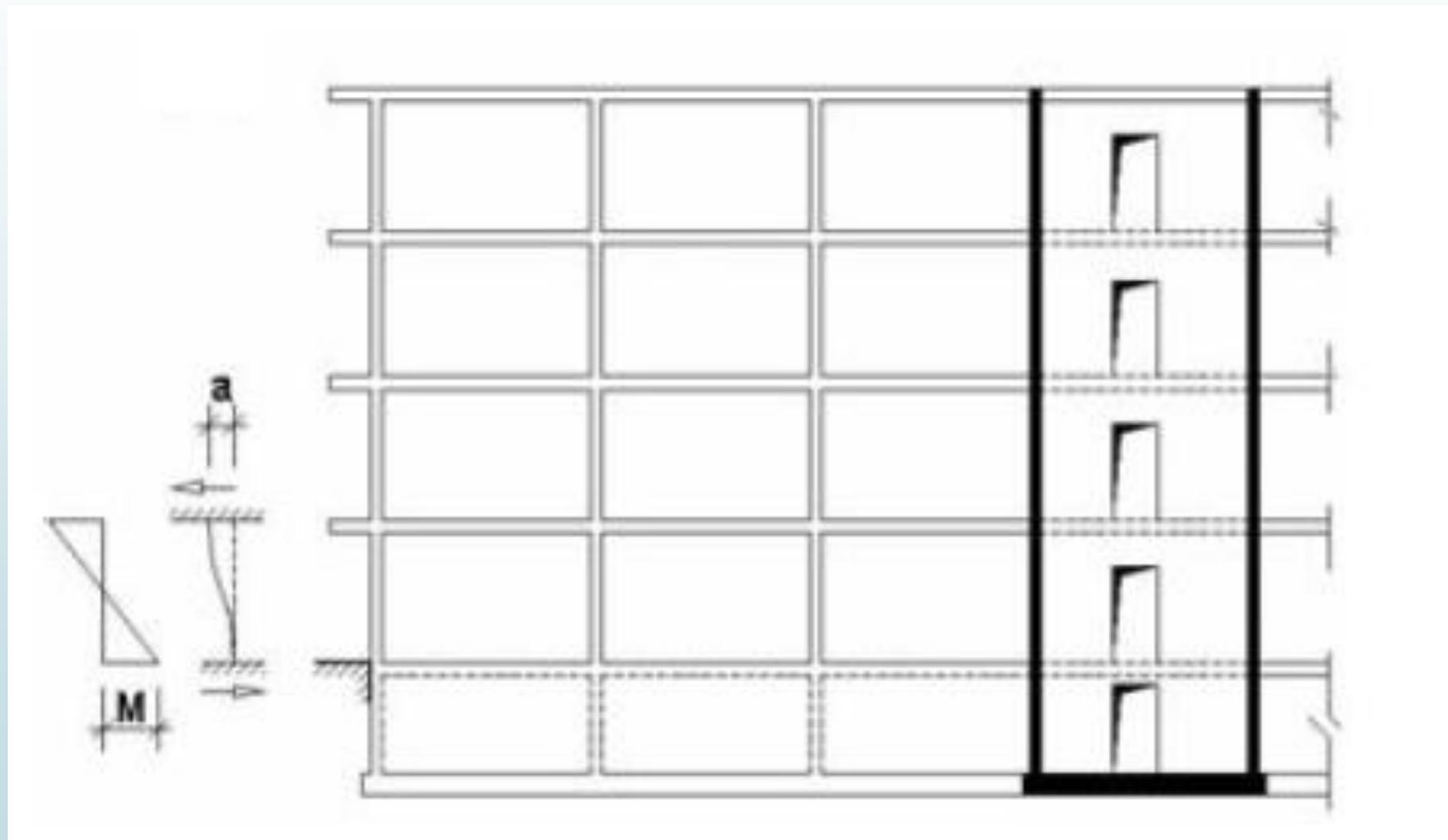
A RIGIDEZ DOS PILARES DEPENDE:

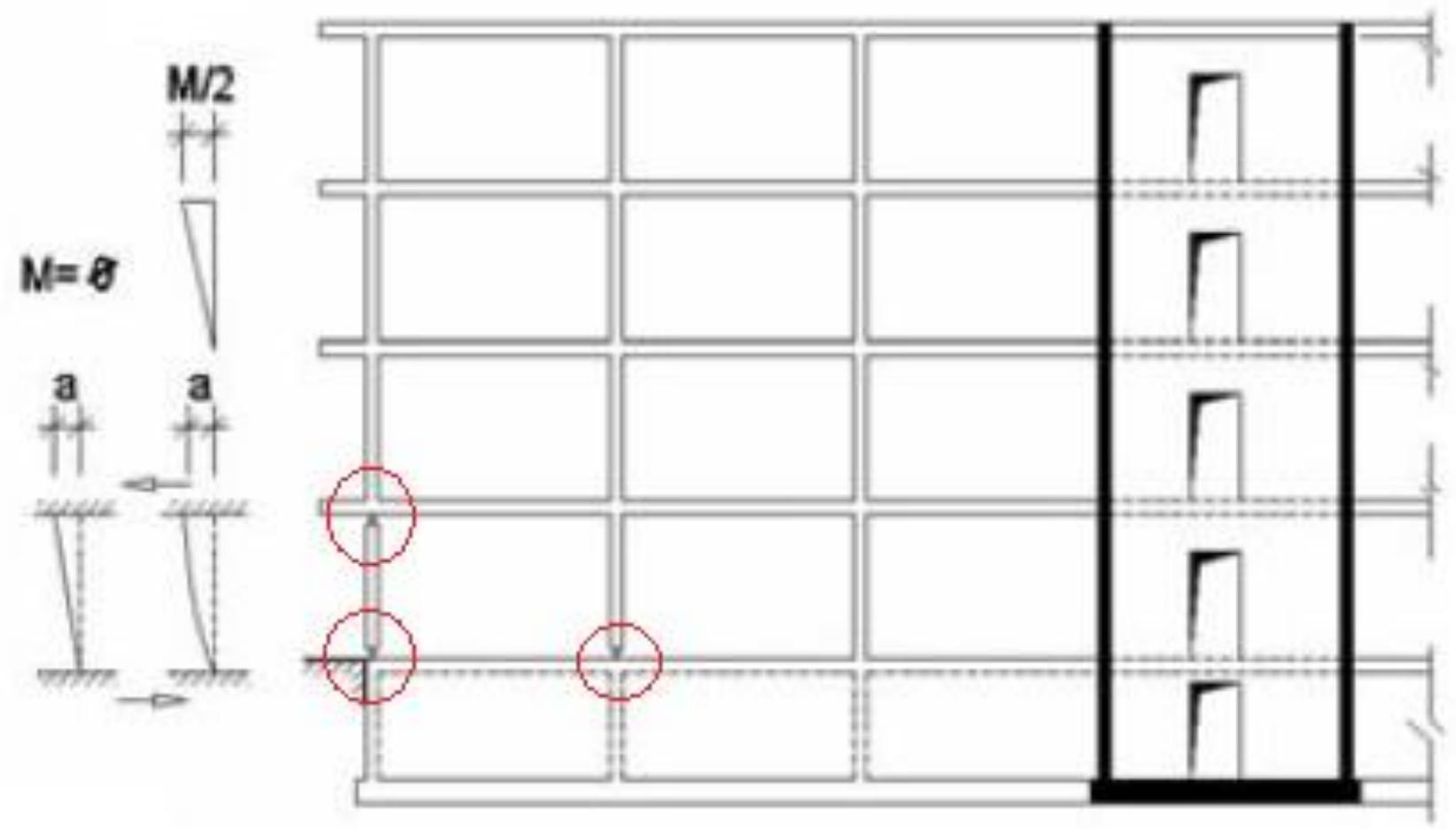
- SEÇÃO TRANSVERSAL;
- TAXA DE ARMADURA;
- **FORÇA NORMAL**

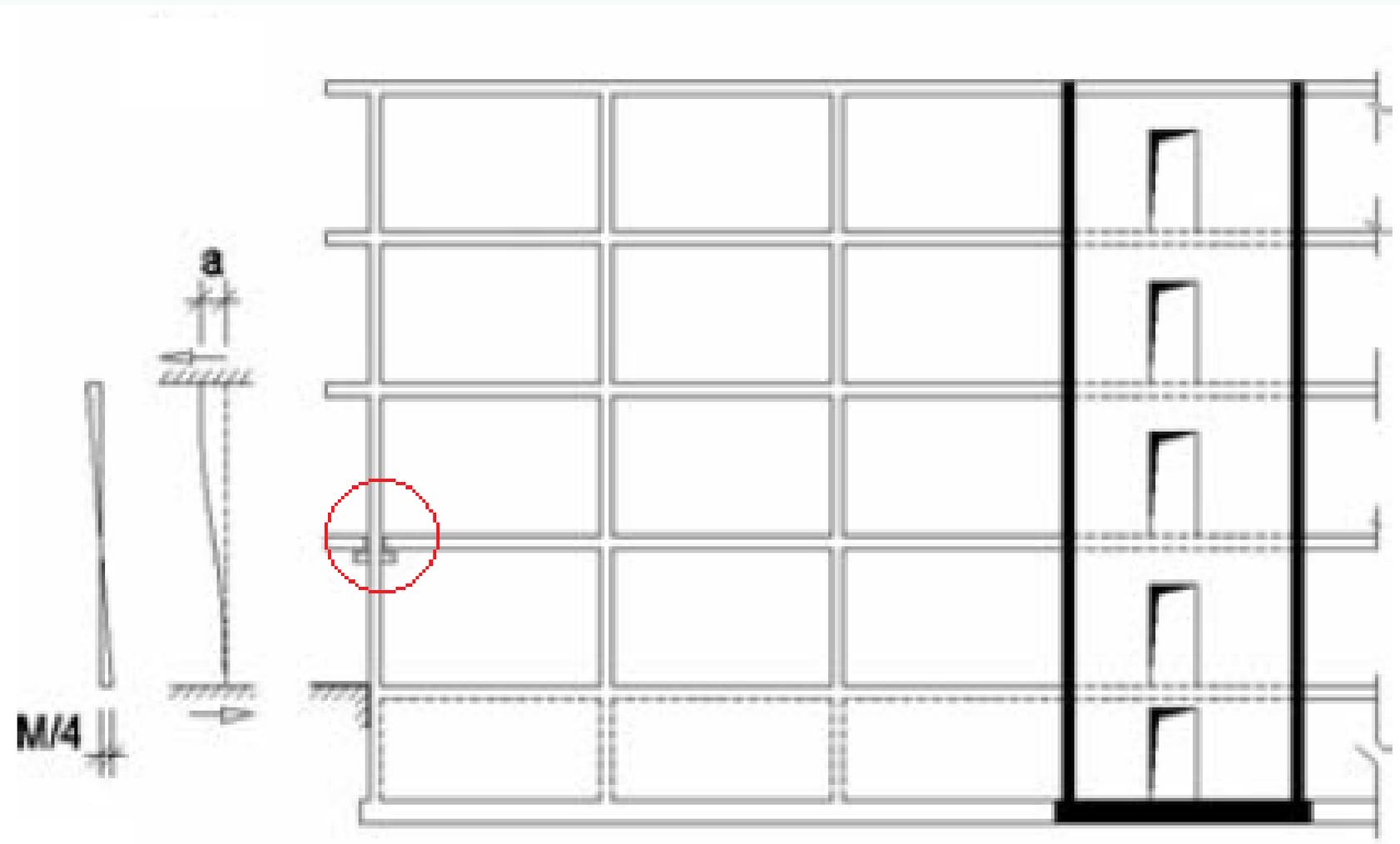


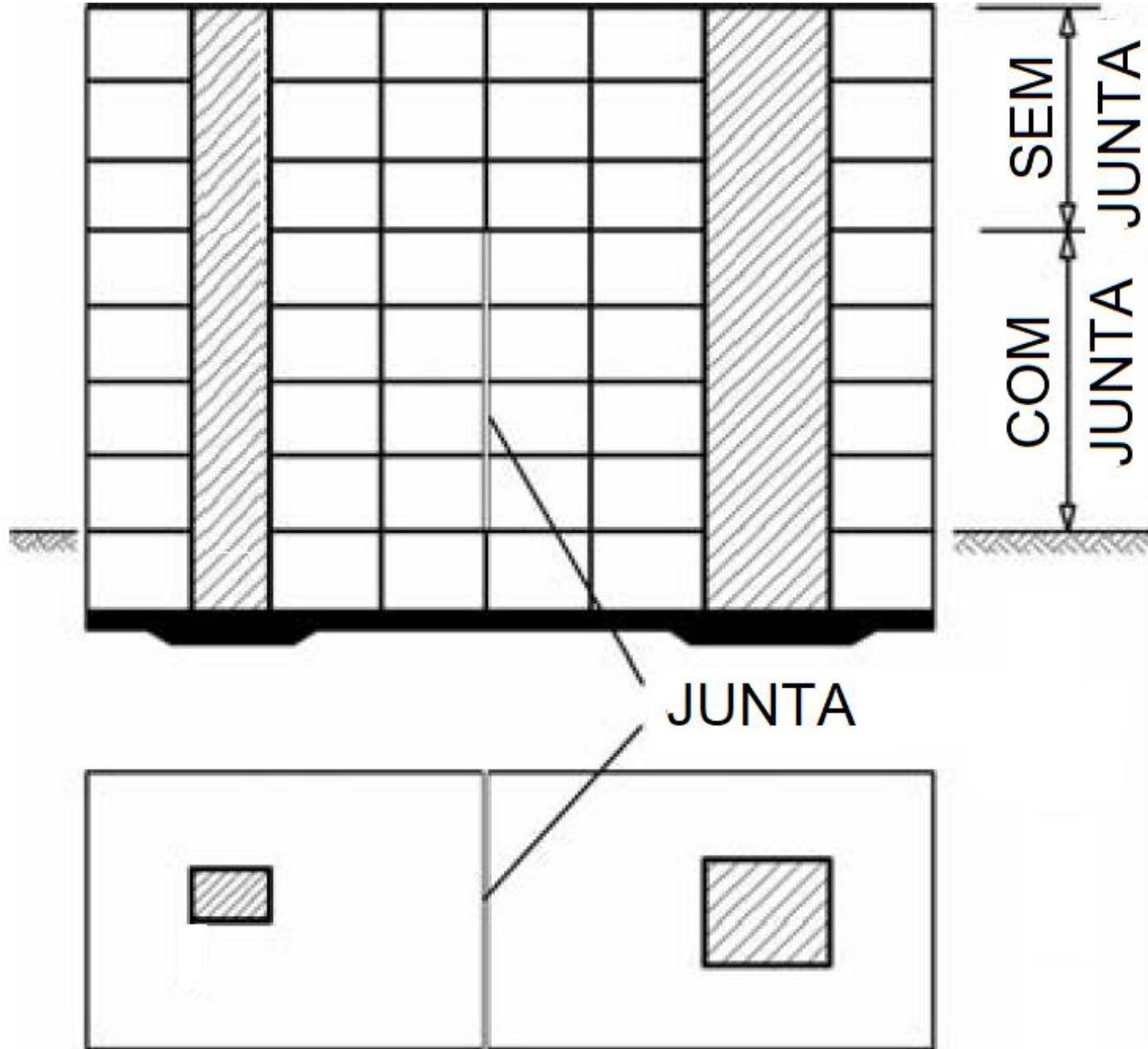
ESTRUTURA APORTICADA DE POUCOS ANDARES

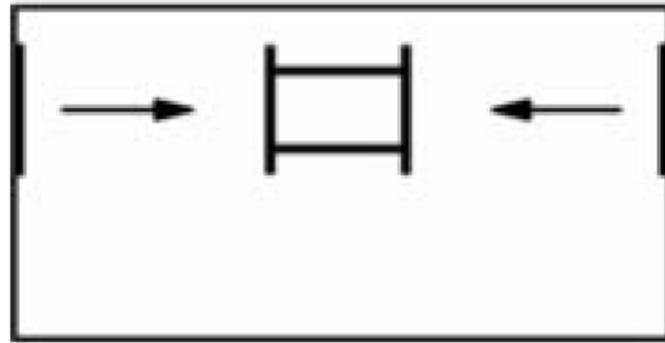
TOLERA JUNTAS MAIS ESPAÇADAS



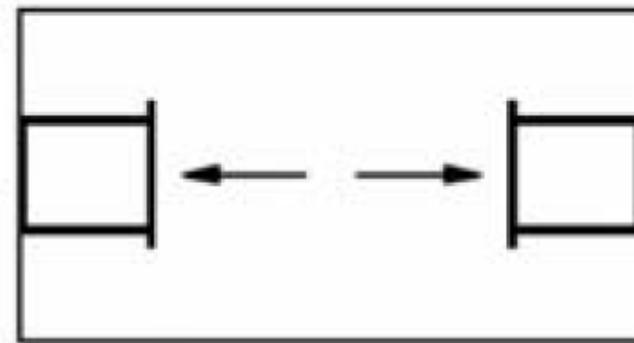








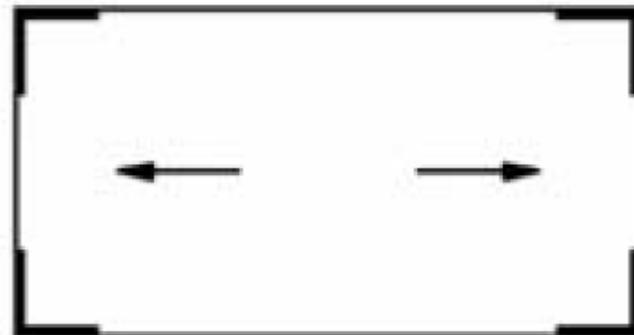
a) favorável



b) desfavorável



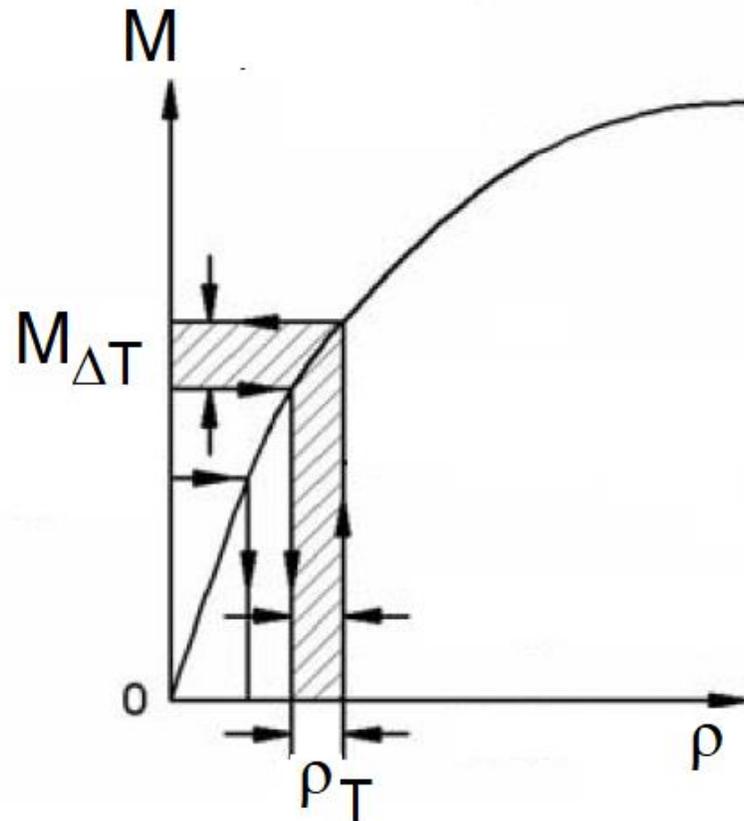
a) favorável



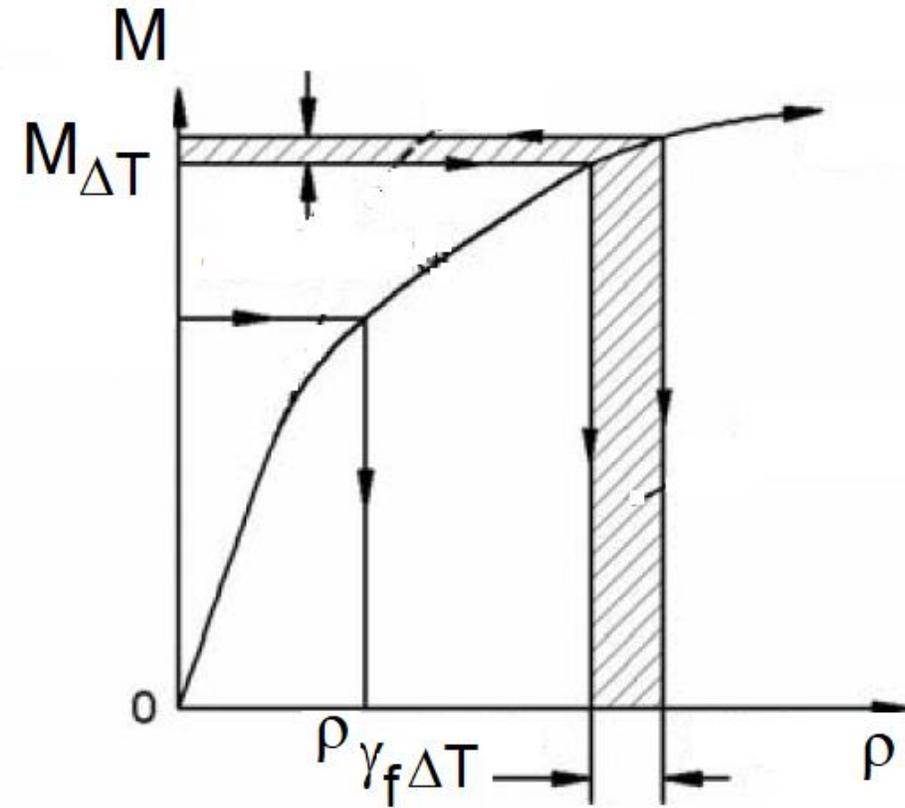
b) desfavorável



ELS



ELU





AS SOLICITAÇÕES DE COMPRESSÃO DEVIDAS ÀS
DEFORMAÇÕES IMPOSTAS DEVEM SER
CONSIDERADAS NO **ELU**



5. MODELAGEM



$(K_N)^I$ – rigidez à tração, elemento não fissurado $= E_c \cdot A_c$

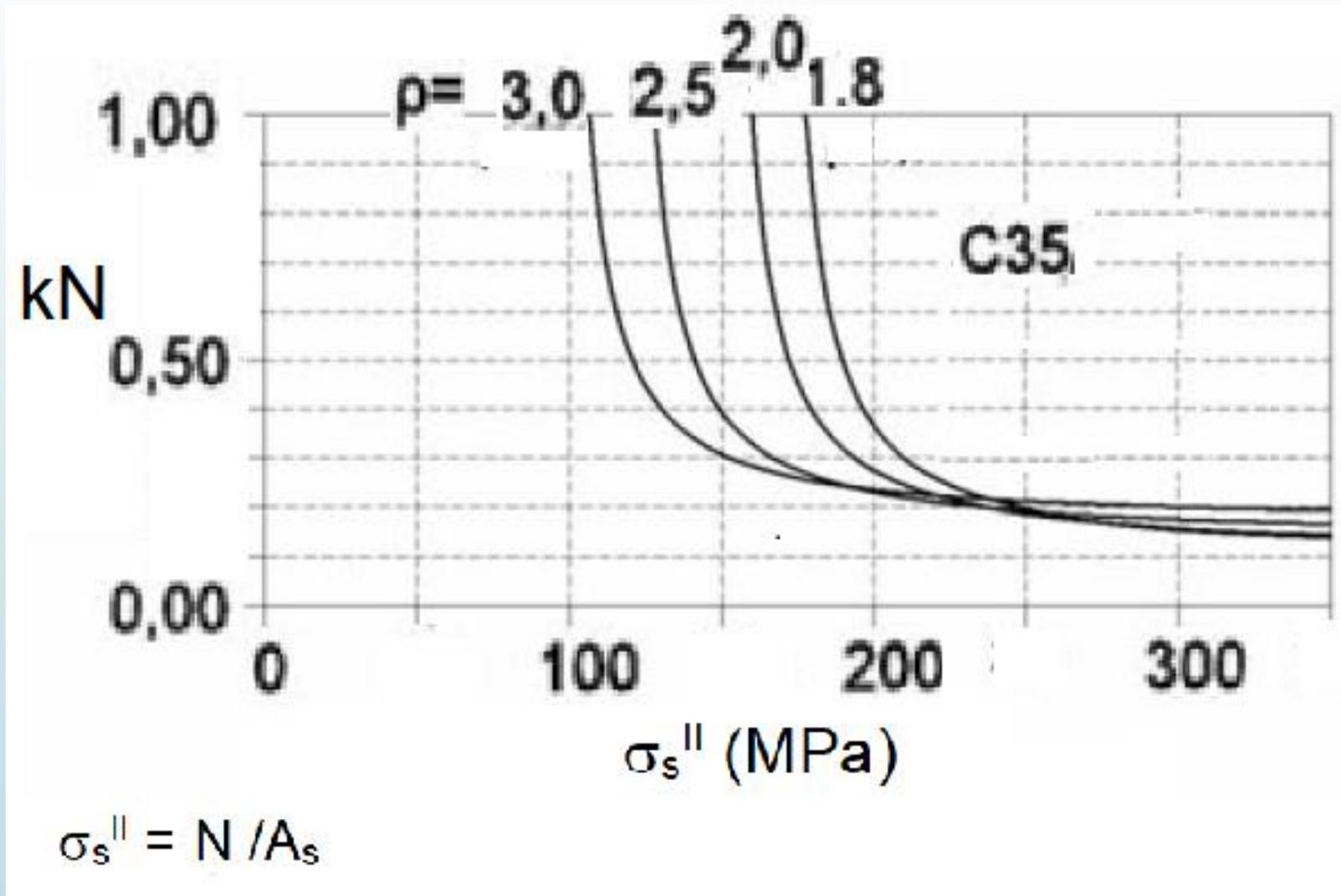
$(K_M)^I$ – rigidez à flexão, elemento não fissurado $= E_c \cdot I_c$

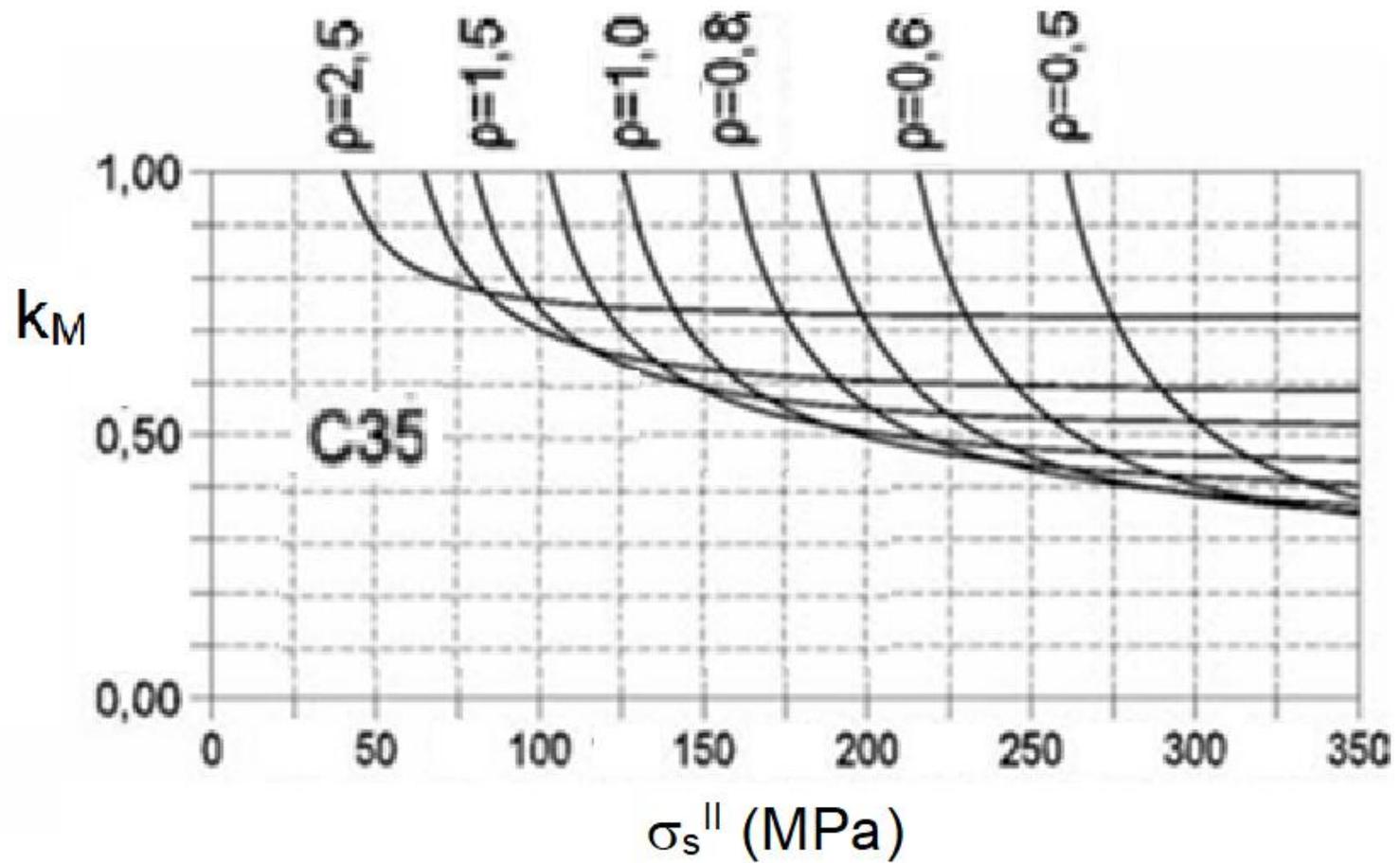
$(K_N)^{II}$ – rigidez à tração, elemento fissurado

$(K_M)^{II}$ – rigidez à flexão, elemento fissurado

$$k_N = K_N^{II} / K_N^I$$

$$k_M = K_M^{II} / K_M^I$$

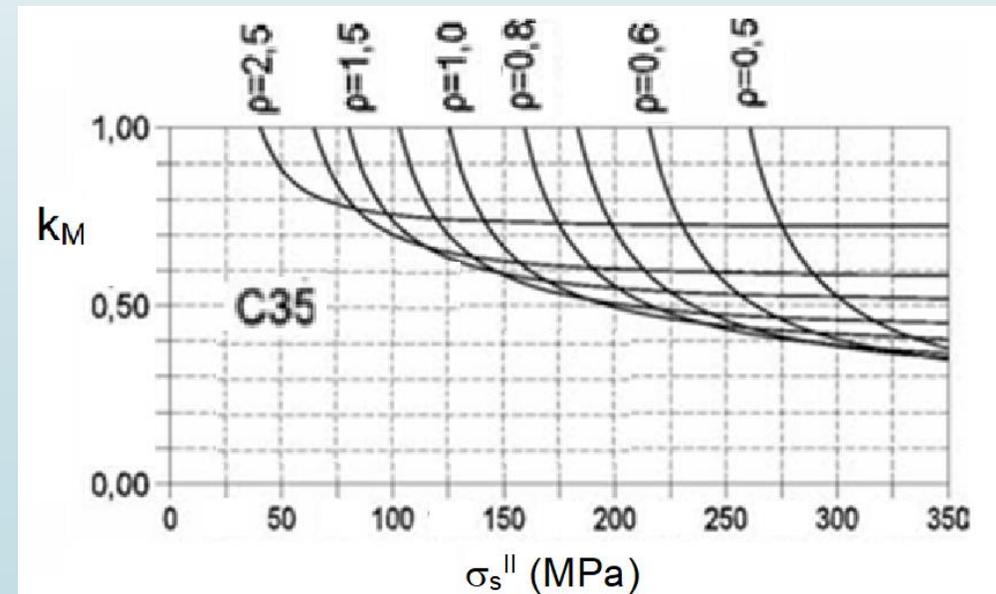
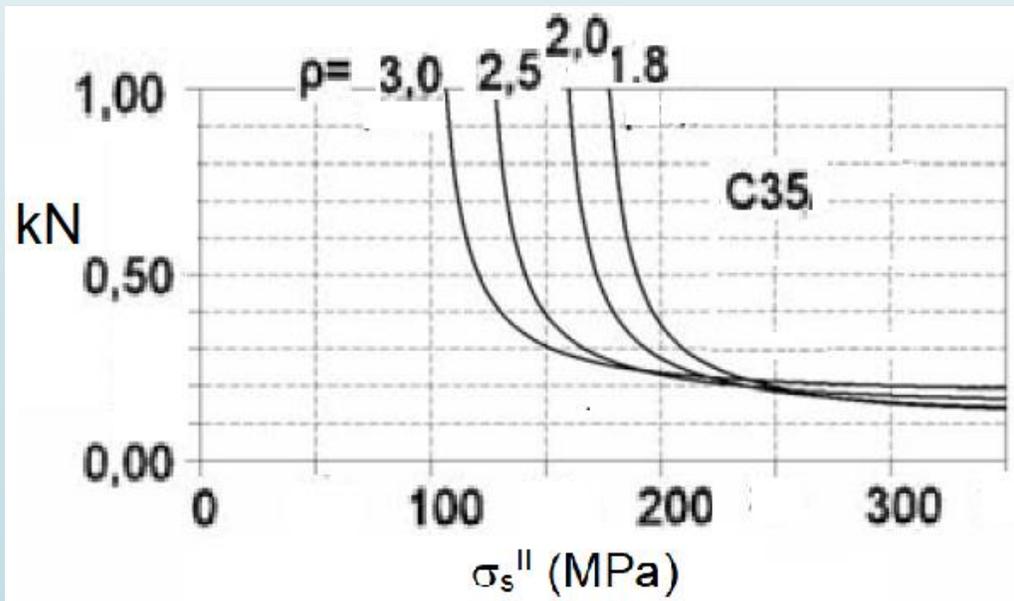




$$\sigma_s^{II} = M / (0,9d.A_s)$$



A rigidez cai rapidamente com a primeira fissura





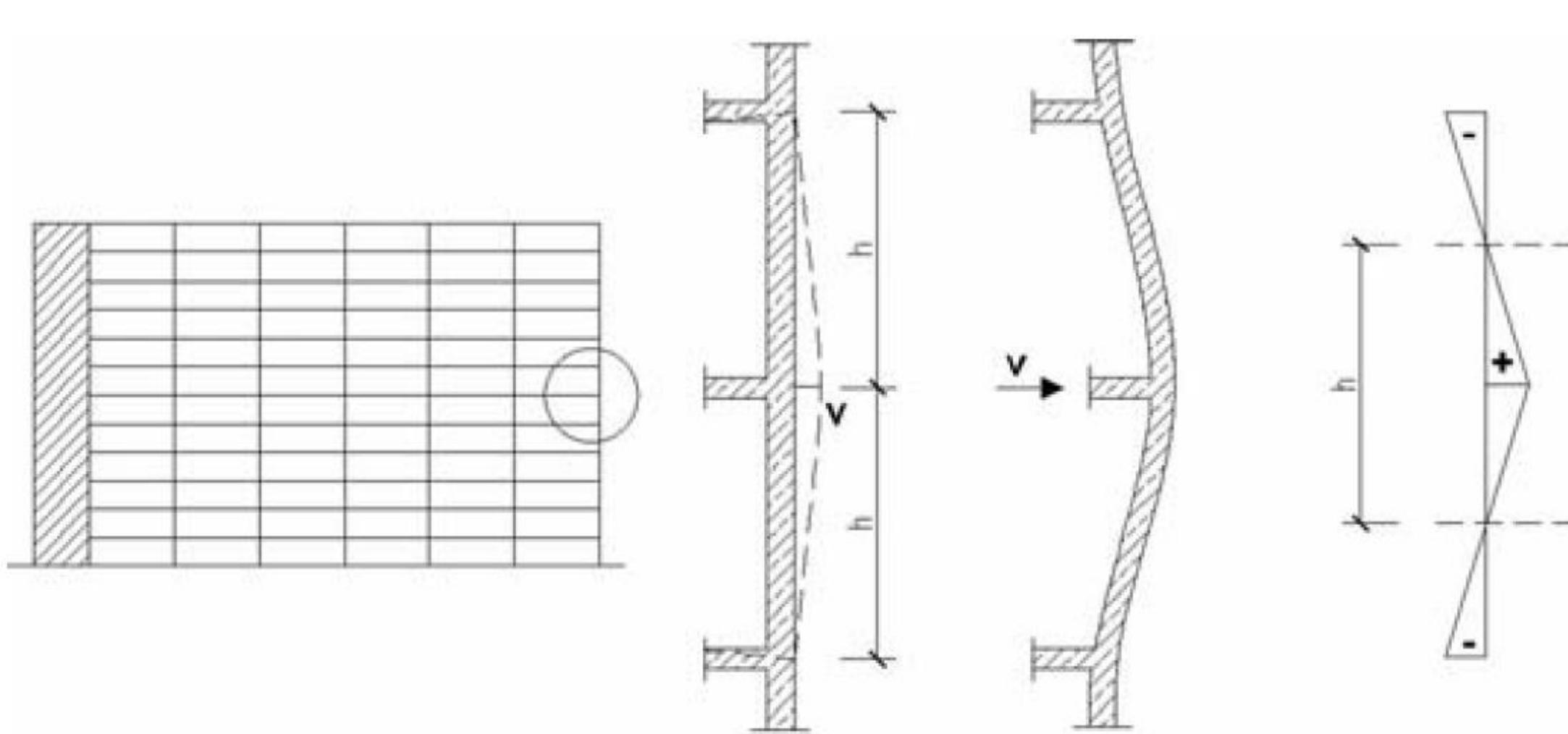
Sob forças de tração: $k_N = 15\%$

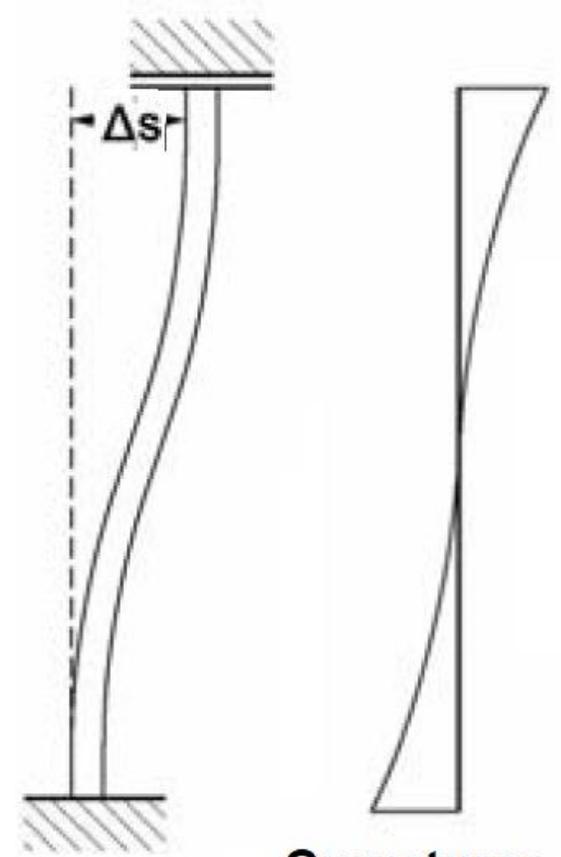
Sob flexão:

Taxa de armadura $\rho = A_s / A_c$ (%)	k_N (%)
0,5 a 1	40
1,01 a 1,8	55
1,81 a 3,0	75



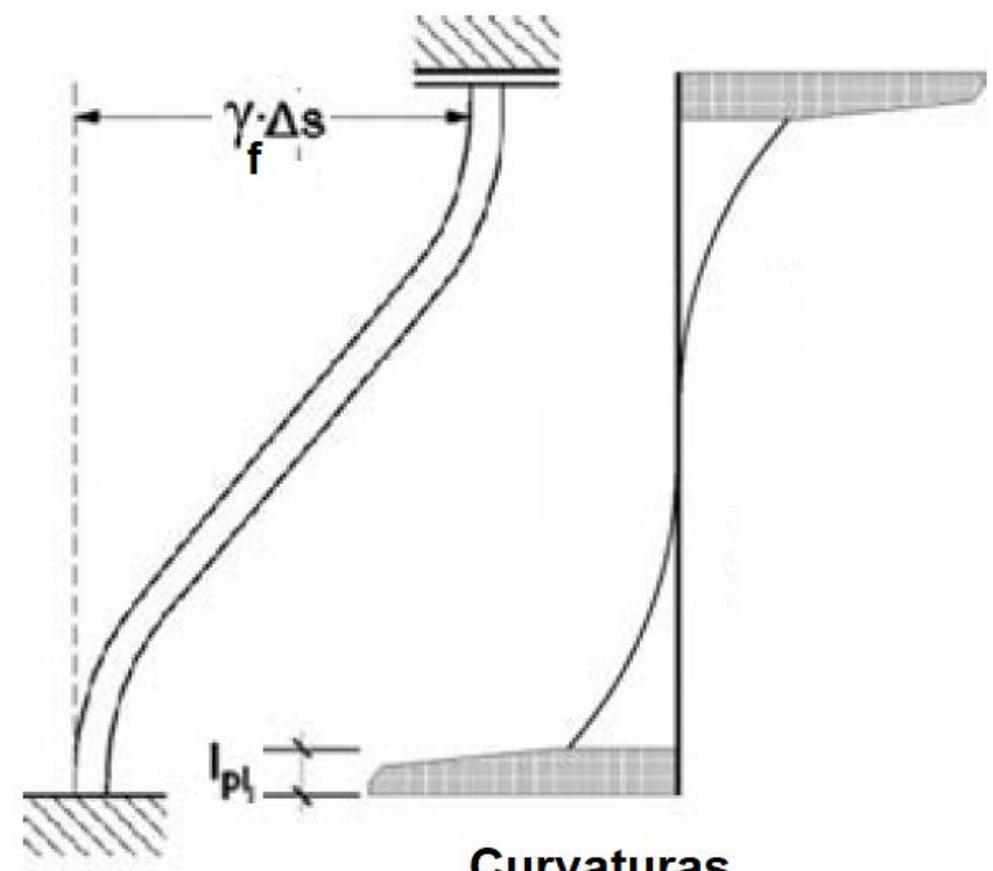
6. DIMENSIONAMENTO





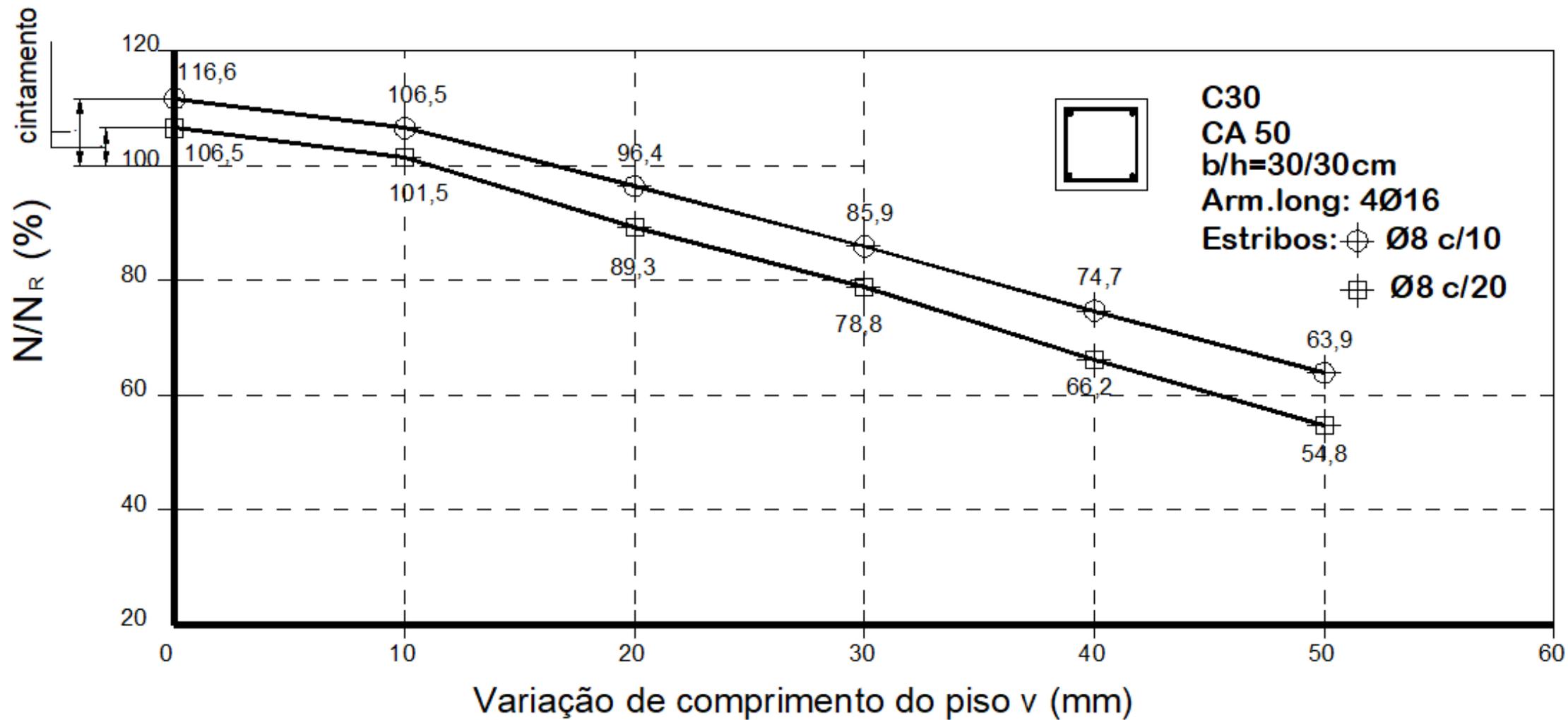
Curvaturas

ELS



Curvaturas

ELU





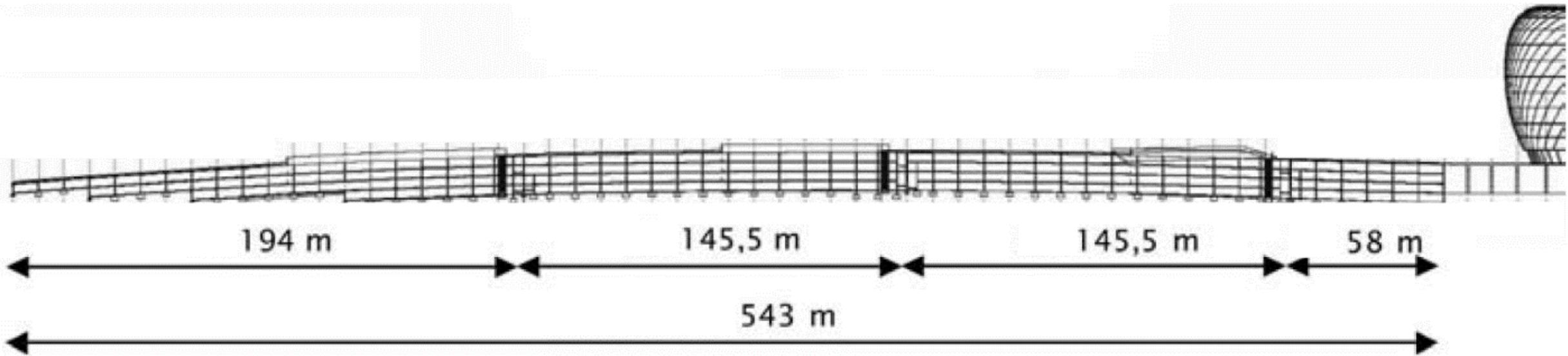
7. ESTACIONAMENTO DA ARENA ALLIANZ, MUNIQUE

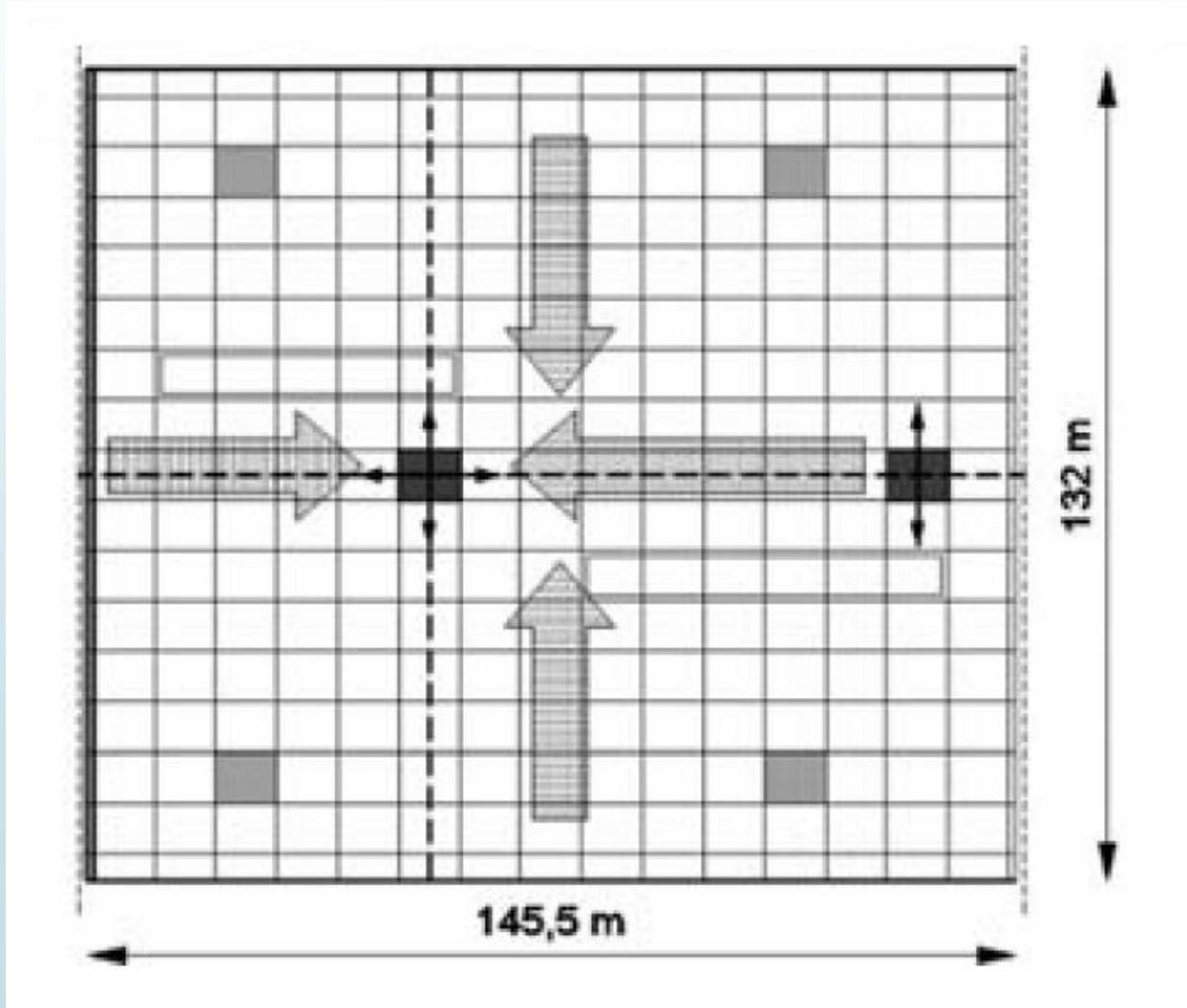


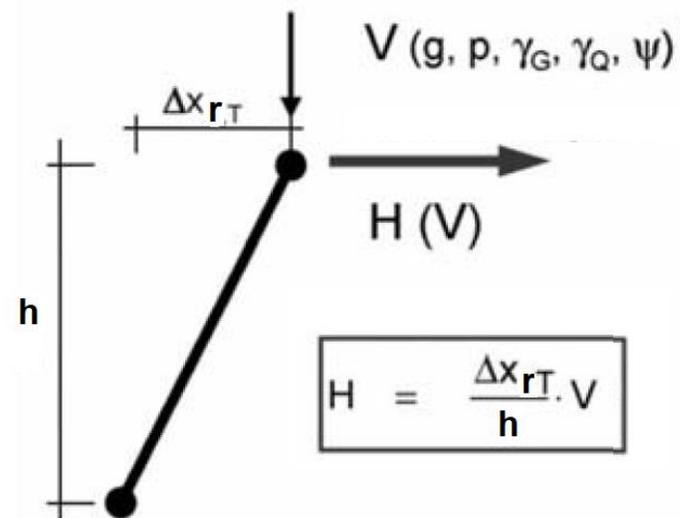
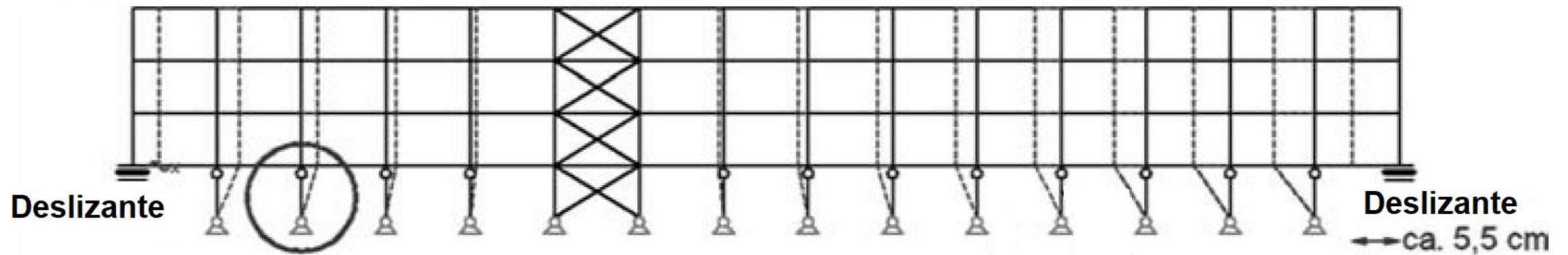














Obrigado pela atenção!