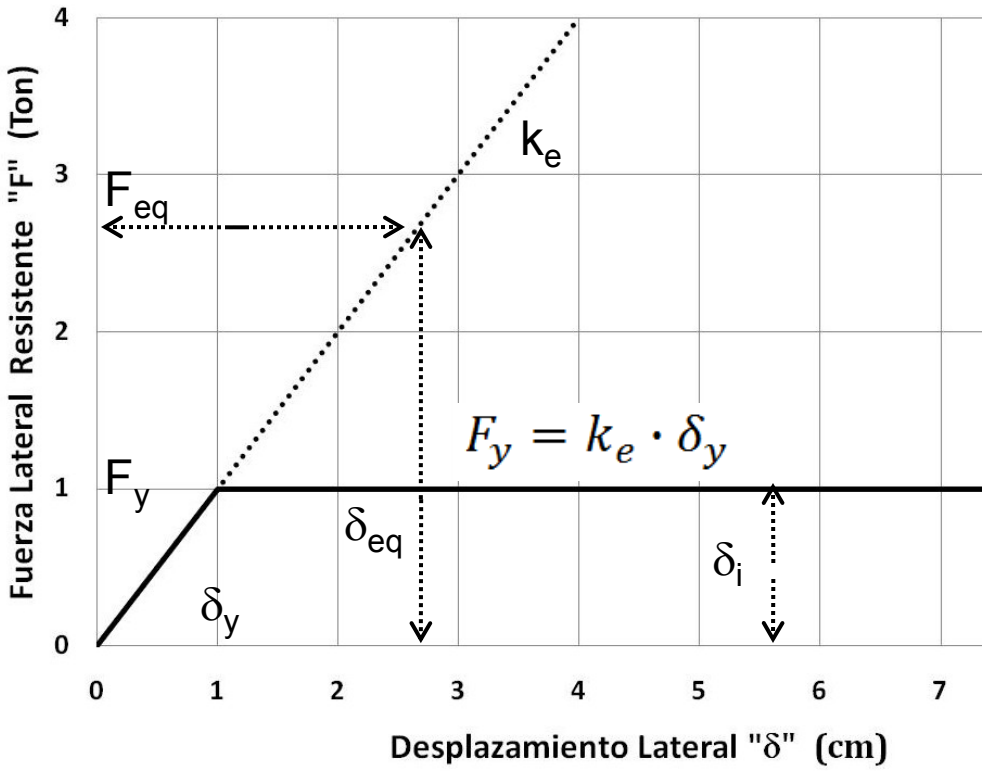
CAPITULO 4 - DINAMICA ESTRUCTURAL

4.8 Comportamiento Inelastico de Sistemas 1GDL

Curva de Capacidad Estructuras 1GDL No-redundantes y sin Efecto P-Δ

$$F_{eq} = k_e \cdot \delta_{eq}$$



$$W_{iac} = \frac{F_y \cdot \delta_y}{2} = \frac{k_e \cdot {\delta_y}^2}{2}$$

$$W_{idc} = F_y \cdot (\delta_i - \delta_y)$$

$$W_{iti} = \frac{k_e \cdot {\delta_y}^2}{2} + k_e \cdot \delta_y \cdot (\delta_i - \delta_y)$$

$$W_{iti} = k_e \cdot \delta_y \cdot \delta_i - \frac{k_e \cdot {\delta_y}^2}{2}$$

$$W_{eq} = \frac{k_e \cdot {\delta_{eq}}^2}{2}$$

$$W_{iti} = W_{eq}$$

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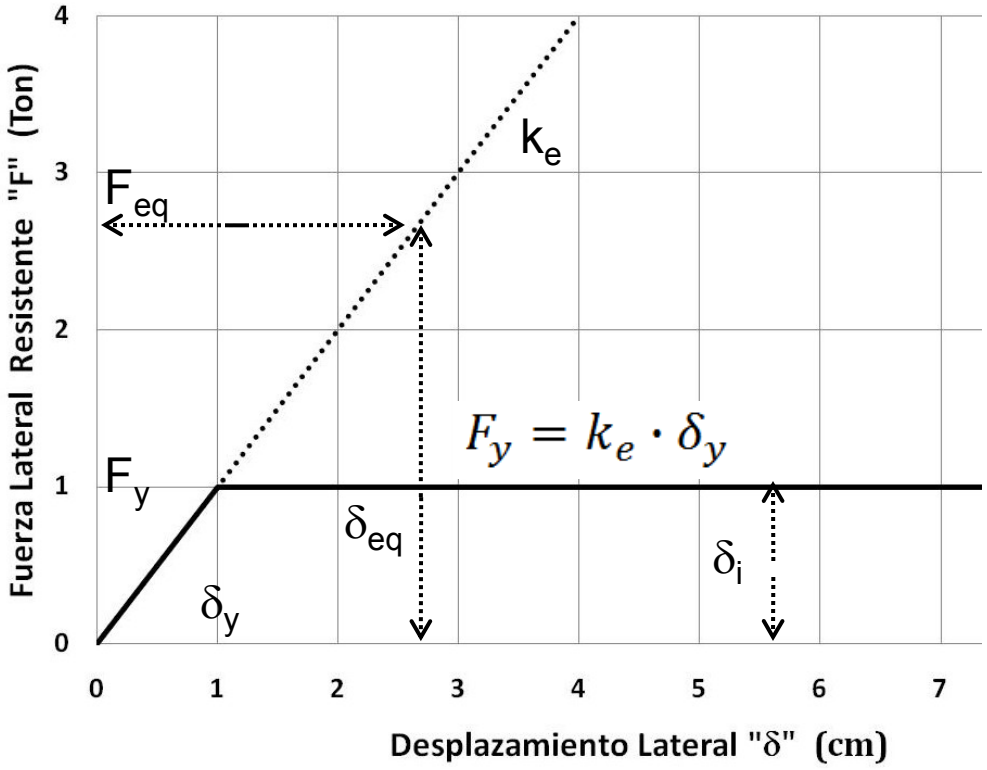
$$F_{eq} = k_e \cdot \delta_{eq}$$



$$W_{iti} = W_{eq} \qquad \Delta = \frac{\delta}{L} \qquad \mu = \frac{\delta_i}{\delta_y} = \frac{\Delta_i}{\Delta_y}$$

$$k_e \cdot \delta_y \cdot \delta_i - \frac{k_e \cdot {\delta_y}^2}{2} = \frac{k_e \cdot {\delta_{eq}}^2}{2}$$

$$2 \cdot \delta_y \cdot \delta_i - {\delta_y}^2 = {\delta_{eq}}^2$$

$$2 \cdot \mu \cdot {\delta_y}^2 - {\delta_y}^2 = {\delta_{eq}}^2$$

$$\delta_{eq} = \delta_y \cdot \sqrt{2 \cdot \mu - 1}$$

$$k_e \cdot \delta_{eq} = k_e \cdot \delta_y \cdot \sqrt{2 \cdot \mu - 1}$$

$$R = \frac{F_{eq}}{F_y} = \sqrt{2 \cdot \mu - 1}$$

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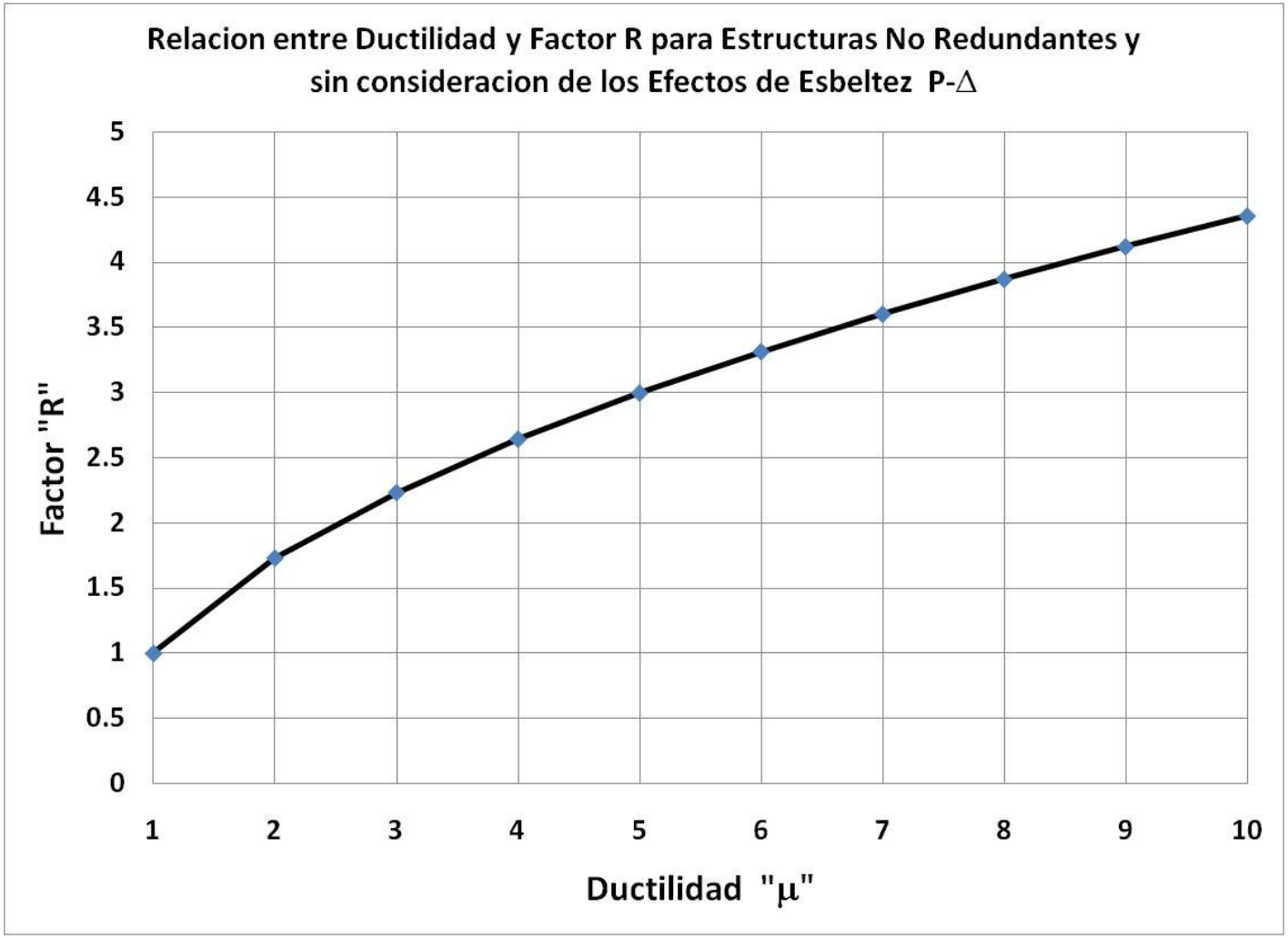

$$\Delta = \frac{\delta}{L}$$

$$\mu = \frac{\delta_i}{\delta_y} = \frac{\Delta_i}{\Delta_y}$$

$$R = \frac{F_{eq}}{F_y} = \sqrt{2 \cdot \mu - 1}$$

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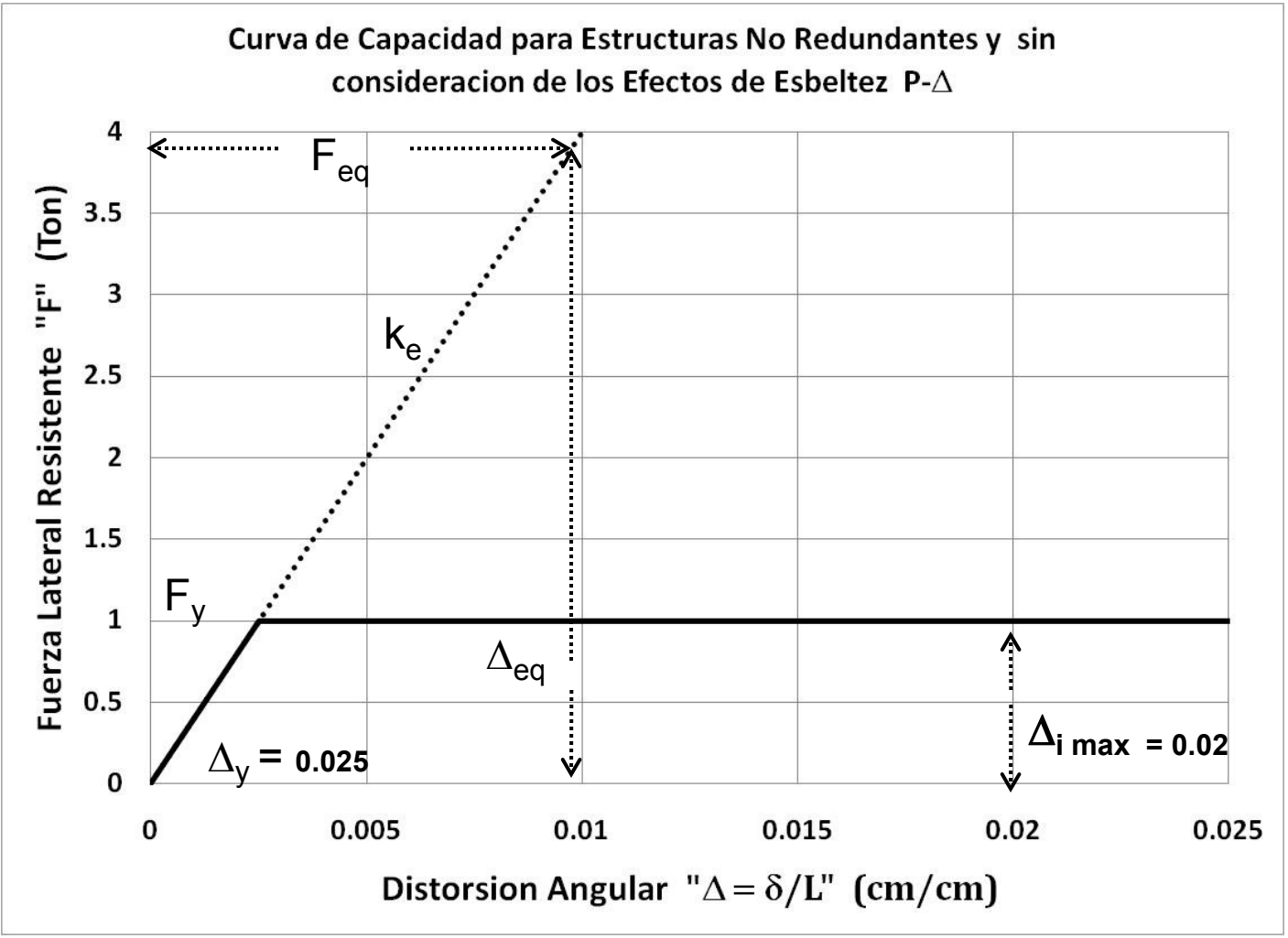

Δi	μ	F_{eq}	Δ_{eq}
0.0025	1	1.00	0.0025
0.005	2	1.73	0.0043
0.0075	3	2.24	0.0056
0.01	4	2.65	0.0066
0.0125	5	3.00	0.0075
0.015	6	3.32	0.0083
0.0175	7	3.61	0.0090
0.02	8	3.87	0.0097

ke = 400 Ton/(m/m)

$$\mu = \frac{\delta_i}{\delta_y} = \frac{\Delta_i}{\Delta_y} \qquad \Delta = \frac{\delta}{L}$$

$$R = \frac{F_{eq}}{F_y} = \sqrt{2 \cdot \mu - 1}$$