Relative Flexural Stiffness of Beam Section to Flexural Stiffness of a Width of Slab

The parameter used to define the relative stiffness of the beam and slab spanning in either direction is $\alpha$, calculated from

$$\alpha = \frac{E_{cb} I_b}{E_{cs} I_s}$$

In which $E_{cb}$ and $E_{cs}$ are the modulus of elasticity of the beam and slab concrete (usually the same) and $I_b$ and $I_s$ are the moments of inertia of the effective beam and the slab.

Effective top width of beam for interior and edge beam

$$b_w + 2h_w \leq b_w + 8h_f$$

Figure: Effective top width of beam for (a) interior and (b) edge beam

Example: Effective Cross Section for $I_b$ and $I_s$ for Edge beam and Interior beam.

Graphically finding Relative Flexural Stiffness of Beam:
Another way of determining $\alpha_{fm}$ is graphically, using Figures below.

$$\alpha_{fin} = \text{average value of } \alpha_f \text{ for all beams on edges of a panel}$$

$$\beta = \text{ratio of clear spans in long to short direction of slab}$$
Figure: Beam Stiffness (Interior Beam)
Figure: Beam Stiffness (Edge or Exterior Beam)