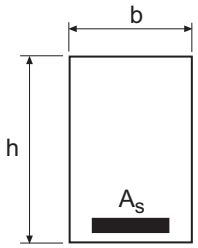
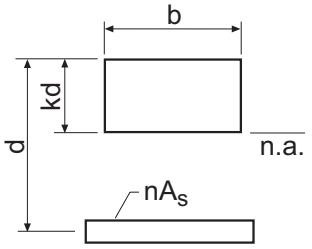
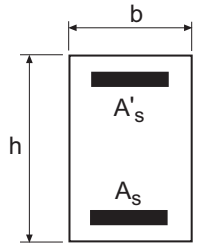
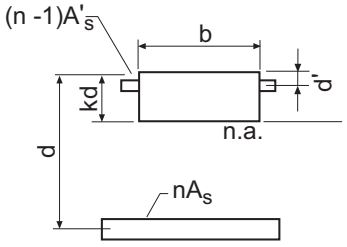
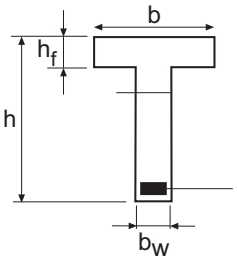
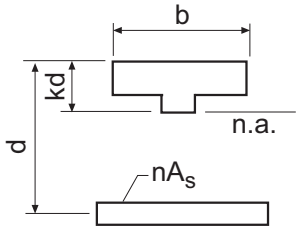
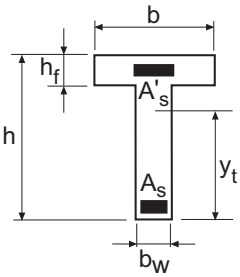
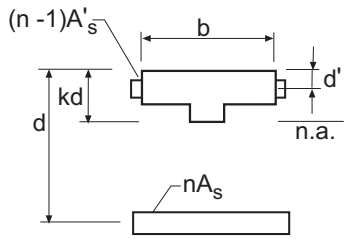
Table 8-2 Gross and Cracked Moment of Inertia of Rectangular and Flanged Section

Gross Section	Cracked Transformed Section	Gross and Cracked Moment of Inertia
	 Without compression steel	$n = \frac{E_s}{E_c}$ $B = \frac{b}{(nA_s)}$ $I_g = \frac{bh^3}{12}$ Without compression steel $kd = \left(\sqrt{2dB+1}-1\right)/B$ $I_{cr} = bk^3d^3/3 + nA_s(d-kd)^2$
	 With compression steel	With compression steel $r = (n-1)A'_s/(nA_s)$ $kd = \left[\sqrt{2dB(1+rd'/d)+(1+r)^2}-(1+r)\right]/B$ $I_{cr} = bk^3d^3/3 + nA_s(d-kd)^2 + (n-1)A'_s(kd-d')^2$
	 Without compression steel	$n = \frac{E_s}{E_c}$ $C = b_w/(nA_s)$, $f = h_f(b-b_w)/(nA_s)$, $y_t = h - 1/2\left[(b-b_w)h_f^2 + b_wh^2\right]/\left[(b-b_w)h_f + b_wh\right]$ $I_g = (b-b_w)h_f^3/12 + b_wh^3/12 + (b-b_w)h_f(h-h_f/2-y_t)^2 + b_wh(y_t-h/2)^2$ Without compression steel $kd = \left[\sqrt{C(2d+h_ff)+(1+f)^2}-(1+f)\right]/C$ $I_{cr} = (b-b_w)h_f^3/12 + b_wk^3d^3/3 + (b-b_w)h_f(kd-h_f/2)^2 + nA_s(d-kd)^2$
	 With compression steel	With compression steel $kd = \left[\sqrt{C(2d+h_ff+2rd')+(f+r+1)^2}-(f+r+1)\right]/C$ $I_{cr} = (b-b_w)h_f^3/12 + b_wk^3d^3/3 + (b-b_w)h_f(kd-h_f/2)^2 + nA_s(d-kd)^2 + (n-1)A'_s(kd-d')2$