

PART VI

Appendix A

Equivalence of Nonhomogenous Equations in SI-Metric,
MKS-Metric, and U.S. Customary Units

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
General	1 MPa	10 kgf/cm ²	142.2 psi
	$f'_c = 21 \text{ MPa}$	$f'_c = 210 \text{ kgf/cm}^2$	$f'_c = 3000 \text{ psi}$
	$f'_c = 28 \text{ MPa}$	$f'_c = 280 \text{ kgf/cm}^2$	$f'_c = 4000 \text{ psi}$
	$f'_c = 35 \text{ MPa}$	$f'_c = 350 \text{ kgf/cm}^2$	$f'_c = 5000 \text{ psi}$
	$f'_c = 40 \text{ MPa}$	$f'_c = 420 \text{ kgf/cm}^2$	$f'_c = 6000 \text{ psi}$
	$f_y = 280 \text{ MPa}$	$f_y = 2800 \text{ kgf/cm}^2$	$f_y = 40,000 \text{ psi}$
	$f_y = 420 \text{ MPa}$	$f_y = 4200 \text{ kgf/cm}^2$	$f_y = 60,000 \text{ psi}$
	$f_{pu} = 1725 \text{ MPa}$	$f_{pu} = 17,600 \text{ kgf/cm}^2$	$f_{pu} = 250,000 \text{ psi}$
	$f_{pu} = 1860 \text{ MP}$	$f_{pu} = 19,000 \text{ kgf/cm}^2$	$f_{pu} = 270,000 \text{ psi}$
	$\sqrt{f'_c} \text{ in MPa}$	$3.18 \sqrt{f'_c} \text{ in kgf/cm}^2$	$12 \sqrt{f'_c} \text{ in psi}$
	$0.313 \sqrt{f'_c} \text{ in MPa}$	$\sqrt{f'_c} \text{ in kgf/cm}^2$	$3.77 \sqrt{f'_c} \text{ in psi}$
	$0.083 \sqrt{f'_c} \text{ in MPa}$	$0.27 \sqrt{f'_c} \text{ in kgf/cm}^2$	$\sqrt{f'_c} \text{ in psi}$
	$0.17 \sqrt{f'_c} \text{ in MPa}$	$0.53 \sqrt{f'_c} \text{ in kgf/cm}^2$	$2 \sqrt{f'_c} \text{ in psi}$
	$f'_{cr} = f'_c + 2.33S_s - 35$	$f'_{cr} = f'_c + 2.33S_s - 35$	$f'_{cr} = f'_c + 2.33S_s - 35$
	$f'_{cr} = f'_c + 7.0$	$f'_{cr} = f'_c + 70$	$f'_{cr} = f'_c + 1000$
	$f'_{cr} = f'_c + 8.3$	$f'_{cr} = f'_c + 84$	$f'_{cr} = f'_c + 1200$
	$f'_{cr} = 1.10f'_c + 5.0$	$f'_{cr} = 1.10f'_c + 50$	$f'_{cr} = 1.10f'_c + 700$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Eq. 6.6.3	$f_r = 0.62\lambda\sqrt{f'_c}$	$f_r = 2\lambda\sqrt{f'_c}$	$f_r = 7.5\lambda\sqrt{f'_c}$
Eq. 6.6.5	$h = \frac{\ell_n \left(0.8 + \frac{f_y}{1400}\right)}{36 + 5\beta(\alpha_{fm} - 0.2)} \geq 125mm$	$h = \frac{\ell_n \left(0.8 + \frac{f_y}{14,000}\right)}{36 + 5\beta(\alpha_{fm} - 0.2)} \geq 125mm$	$h = \frac{\ell_n \left(0.8 + \frac{f_y}{200,000}\right)}{36 + 5\beta(\alpha_{fm} - 0.2)} \geq 5mm$
Eq. 6.6.6	$h = \frac{\ell_n \left(0.8 + \frac{f_y}{1400}\right)}{36 + 9\beta} \geq 90mm$	$h = \frac{\ell_n \left(0.8 + \frac{f_y}{14,000}\right)}{36 + 9\beta} \geq 9cm$	$h = \frac{\ell_n \left(0.8 + \frac{f_y}{200,000}\right)}{36 + 9\beta} \geq 3.5in$
Eq. 6.6.10	$A \frac{0.25\sqrt{f'_c}}{f_y} \frac{1.4}{w} \frac{1}{f_y w_{s,min}}$	$A \frac{0.8\sqrt{f'_c}}{f_y} \frac{14}{w} \frac{1}{f_y w_{s,min}}$	$A \frac{3\sqrt{f'_c}}{f_y} \frac{200}{w} \frac{1}{f_y w_{s,min}}$
Eq. 6.6.11	$s = 380 \left(\frac{280}{f_s}\right) - 2.5c_c \leq 300 \left(\frac{280}{f_s}\right)$	$s = 38 \left(\frac{2800}{f_s}\right) - 2.5c_c \leq 30 \left(\frac{2800}{f_s}\right)$	$s = 15 \left(\frac{40,000}{f_s}\right) - 2.5c_c \leq 12 \left(\frac{40,000}{f_s}\right)$
Eq. 6.6.24	$M_{2,min} = P_u (15 + 0.03h)$	$M_{2,min} = P_u (1.5 + 0.03h)$	$M_{2,min} = P_u (0.6 + 0.03h)$
Eq. 6.6.49	$V_c = 0.17\lambda\sqrt{f'_c}b_wd$	$V_c = 0.53\lambda\sqrt{f'_c}b_wd$	$V_c = 2\lambda\sqrt{f'_c}b_wd$
Eq. 6.6.50	$V_c = 0.17 \left(1 + \frac{N_u}{14A_g}\right) \lambda\sqrt{f'_c}b_wd$	$V_c = 0.53 \left(1 + \frac{N_u}{140A_g}\right) \lambda\sqrt{f'_c}b_wd$	$V_c = 2 \left(1 + \frac{N_u}{2000A_g}\right) \lambda\sqrt{f'_c}b_wd$
Eq. 6.6.51	$V_c = \left(0.16\lambda\sqrt{f'_c} + 17\rho_w \frac{V_u d}{M_u}\right) b_wd \leq 0.29\lambda\sqrt{f'_c}b_wd$	$V_c = \left(0.5\lambda\sqrt{f'_c} + 176\rho_w \frac{V_u d}{M_u}\right) b_wd \leq 0.93\lambda\sqrt{f'_c}b_wd$	$V_c = \left(1.9\lambda\sqrt{f'_c} + 25006\rho_w \frac{V_u d}{M_u}\right) b_wd \leq 3.5\lambda\sqrt{f'_c}b_wd$
Eq. 6.6.53	$V_c = 0.29\lambda\sqrt{f'_c}b_wd \sqrt{1 + \frac{0.29N_u}{A_g}}$	$V_c = 0.93\lambda\sqrt{f'_c}b_wd \sqrt{1 + \frac{N_u}{35A_g}}$	$V_c = 3.5\lambda\sqrt{f'_c}b_wd \sqrt{1 + \frac{N_u}{500A_g}}$
Eq. 6.6.54	$V_c = 0.17 \left(1 + \frac{0.29N_u}{A_g}\right) \lambda\sqrt{f'_c}b_wd \geq 0$	$V_c = 0.53 \left(1 + \frac{N_u}{35A_g}\right) \lambda\sqrt{f'_c}b_wd \geq 0$	$V_c = 2 \left(1 + \frac{N_u}{500A_g}\right) \lambda\sqrt{f'_c}b_wd \geq 0$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Eq. 6.6.55	$A\sqrt{f'_c}\frac{b_ws}{f_{yt}} \geq 0.35\frac{b_ws}{f_{yt}}$	$A\sqrt{f'_c}\frac{b_ws}{f_{yt}} \geq 3.5\frac{b_ws}{f_{yt}}$	$A\sqrt{f'_c}\frac{b_ws}{f_{yt}} \geq 50\frac{b_ws}{f_{yt}}$
Eq. 6.6.58	$V_s = A_v f_y \sin \alpha \leq 0.25\sqrt{f'_c}b_w d$	$V_s = A_v f_y \sin \alpha \leq 0.8\sqrt{f'_c}b_w d$	$V_s = A_v f_y \sin \alpha \leq 3\sqrt{f'_c}b_w d$
Eq. 6.6.59	$\sqrt{\left(\frac{V_u}{b_w d}\right)^2 + \left(\frac{T_u p_h}{1.7A_{oh}^2}\right)^2} \leq \phi \left(\frac{V_c}{b_w d} + 0.66\sqrt{f'_c}\right)$	$\sqrt{\left(\frac{V_u}{b_w d}\right)^2 + \left(\frac{T_u p_h}{1.7A_{oh}^2}\right)^2} \leq \phi \left(\frac{V_c}{b_w d} + 2\sqrt{f'_c}\right)$	$\sqrt{\left(\frac{V_u}{b_w d}\right)^2 + \left(\frac{T_u p_h}{1.7A_{oh}^2}\right)^2} \leq \phi \left(\frac{V_c}{b_w d} + 8\sqrt{f'_c}\right)$
Eq. 6.6.60	$\left(\frac{V_u}{b_w d}\right) + \left(\frac{T_u p_h}{1.7A_{oh}^2}\right) \leq \phi \left(\frac{V_c}{b_w d} + 0.66\sqrt{f'_c}\right)$	$\left(\frac{V_u}{b_w d}\right) + \left(\frac{T_u p_h}{1.7A_{oh}^2}\right) \leq \phi \left(\frac{V_c}{b_w d} + 2\sqrt{f'_c}\right)$	$\left(\frac{V_u}{b_w d}\right) + \left(\frac{T_u p_h}{1.7A_{oh}^2}\right) \leq \phi \left(\frac{V_c}{b_w d} + 8\sqrt{f'_c}\right)$
Eq. 6.6.64	$(A_v + 2A_t) = 0.062\sqrt{f'_c}\frac{b_ws}{f_{yt}} \geq \frac{0.35b_ws}{f_{yt}}$	$(A_v + 2A_t) = 0.2\sqrt{f'_c}\frac{b_ws}{f_{yt}} \geq \frac{3.5b_ws}{f_{yt}}$	$(A_v + 2A_t) = 0.75\sqrt{f'_c}\frac{b_ws}{f_{yt}} \geq \frac{50b_ws}{f_{yt}}$
Eq. 6.6.65	$A\frac{0.42\sqrt{f'_c}A_{cp}\left(\frac{A_t}{s}\right)_h f_{yt}}{f_y} \geq \frac{A_t}{s} \geq \frac{0.175b_w}{f_{yt}}$	$A\frac{1.33\sqrt{f'_c}A_{cp}\left(\frac{A_t}{s}\right)_h f_{yt}}{f_y} \geq \frac{A_t}{s} \geq \frac{1.75b_w}{f_{yt}}$	$A\frac{5\sqrt{f'_c}A_{cp}\left(\frac{A_t}{s}\right)_h f_{yt}}{f_y} \geq \frac{A_t}{s} \geq \frac{25b_w}{f_{yt}}$
Eq. 6.6.68	$V_c = 0.27\lambda\sqrt{f'_c}h + \frac{N_u d}{4\ell_w}$	$V_c = 0.88\lambda\sqrt{f'_c}hd + \frac{N_u d}{4\ell_w}$	$V_c = 3.3\lambda\sqrt{f'_c}hd + \frac{N_u d}{4\ell_w}$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Eq. 6.6.69	$V_c = \left[0.05\lambda\sqrt{f'_c} + \frac{l_w \left(0.1\lambda\sqrt{f'_c} + \frac{0.2N_u}{l_w h} \right)}{\frac{M_u}{V_u} - \frac{l_w}{2}} \right] h d$	$V_c = \left[0.16\lambda\sqrt{f'_c} + \frac{\ell_w \left(0.33\lambda\sqrt{f'_c} + \frac{0.2N_u}{\ell_w h} \right)}{\frac{M_u}{V_u} - \frac{\ell_w}{2}} \right] h d$	$V_c = \left[0.6\lambda\sqrt{f'_c} + \frac{\ell_w \left(1.25\lambda\sqrt{f'_c} + \frac{0.2N_u}{\ell_w h} \right)}{\frac{M_u}{V_u} - \frac{\ell_w}{2}} \right] h d$
Eq. 6.6.72	$V_c = 0.17 \left(1 + \frac{2}{\beta} \right) \lambda \sqrt{f'_c} b_o d$	$V_c = 0.53 \left(1 + \frac{2}{\beta} \right) \lambda \sqrt{f'_c} b_o d$	$V_c = \left(2 + \frac{4}{\beta} \right) \lambda \sqrt{f'_c} b_o d$
Eq. 6.6.73	$V_c = 0.083 \left(\frac{\alpha_s d}{b_o} + 2 \right) \lambda \sqrt{f'_c} b_o d$	$V_c = 0.27 \left(\frac{\alpha_s d}{b_o} + 2 \right) \lambda \sqrt{f'_c} b_o d$	$V_c = \left(\frac{\alpha_s d}{b_o} + 2 \right) \lambda \sqrt{f'_c} b_o d$
Eq. 6.6.74	$V_c = 0.33\lambda\sqrt{f'_c} b_o d$	$V_c = \lambda\sqrt{f'_c} b_o d$	$V_c = 4\lambda\sqrt{f'_c} b_o d$
Eq. 6.8.1	$\ell_d = \frac{f_y}{1.1\lambda\sqrt{f'_c}} \frac{\psi_t \psi_e \psi_s}{\left(\frac{c_b + K_{tr}}{d_b} \right)} d_b$	$\ell_d = \frac{f_y}{3.5\lambda\sqrt{f'_c}} \frac{\psi_t \psi_e \psi_s}{\left(\frac{c_b + K_{tr}}{d_b} \right)} d_b$	$\ell_d = \frac{3f_y}{40\lambda\sqrt{f'_c}} \frac{\psi_t \psi_e \psi_s}{\left(\frac{c_b + K_{tr}}{d_b} \right)} d_b$
Eq. 6.8.4	$\ell_d = 3.3 \left(\frac{A_b}{s} \right) \left(\frac{f_y}{\lambda\sqrt{f'_c}} \right)$	$\ell_d = \left(\frac{A_b}{s} \right) \left(\frac{f_y}{\lambda\sqrt{f'_c}} \right)$	$\ell_d = 0.27 \left(\frac{A_b}{s} \right) \left(\frac{f_y}{\lambda\sqrt{f'_c}} \right)$
Eq. 6.8.9	$\ell_{dh} = \frac{f_y d_b}{5.4\sqrt{f'_c}}$	$\ell_{dh} = \frac{f_y d_b}{17.2\sqrt{f'_c}}$	$\ell_{dh} = \frac{f_y d_b}{65\sqrt{f'_c}}$
Eq. 6.8.10	$V_n = A_{cv} (0.17\lambda\sqrt{f'_c} + \rho_n f_y)$	$V_n = A_{cv} (0.53\lambda\sqrt{f'_c} + \rho_n f_y)$	$V_n = A_{cv} (2\lambda\sqrt{f'_c} + \rho_n f_y)$
Eq. 6.8.11	$V_n = 2A_{vd} f_y \sin \alpha$ $\leq 0.83\sqrt{f'_c} A_{cw}$	$V_n = 2A_{vd} f_y \sin \alpha$ $\leq 2.65\sqrt{f'_c} A_{cw}$	$V_n = 2A_{vd} f_y \sin \alpha$ $\leq 10\sqrt{f'_c} A_{cw}$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Eq. 6.8.14	$V_n = A_{cv}(\alpha_c \lambda \sqrt{f'_c} + \rho_n f_y)$ $\alpha_c = 0.25 \text{ for } \frac{h_w}{\ell_w} \leq 1.5$ $\alpha_c = 0.17 \text{ for } \frac{h_w}{\ell_w} \geq 2.0$	$V_n = A_{cv}(\alpha_c \lambda \sqrt{f'_c} + \rho_n f_y)$ $\alpha_c = 0.80 \text{ for } \frac{h_w}{\ell_w} \leq 1.5$ $\alpha_c = 0.53 \text{ for } \frac{h_w}{\ell_w} \geq 2.0$	$V_n = A_{cv}(\alpha_c \lambda \sqrt{f'_c} + \rho_n f_y)$ $\alpha_c = 3.0 \text{ for } \frac{h_w}{\ell_w} \leq 1.5$ $\alpha_c = 2.0 \text{ for } \frac{h_w}{\ell_w} \geq 2.0$
Eq. D.7	$N_b = k_c \lambda \sqrt{f'_c} h_{ef}^{1.5}$ $k_c = 10 \text{ or } 7$	$N_b = k_c \lambda \sqrt{f'_c} h_{ef}^{1.5}$ $k_c = 10 \text{ or } 7$	$N_b = k_c \lambda \sqrt{f'_c} h_{ef}^{1.5}$ $k_c = 24 \text{ or } 17$
Eq. D.8	$N_b = 3.9 \lambda \sqrt{f'_c} h_{ef}^{5/3}$	$N_b = 5.8 \lambda \sqrt{f'_c} h_{ef}^{5/3}$	$N_b = 16 \lambda \sqrt{f'_c} h_{ef}^{5/3}$
Eq. D.17	$N_{sb} = 13 c_{a1} \sqrt{A_{brg} \lambda \sqrt{f'_c}}$	$N_{sb} = 42.5 c_{a1} \sqrt{A_{brg} \lambda \sqrt{f'_c}}$	$N_{sb} = 160 c_{a1} \sqrt{A_{brg} \lambda \sqrt{f'_c}}$
Eq. D.24	V_b $= 0.6 \left(\frac{\lambda_e}{d_a} \right)^{0.2} \sqrt{d_a} \lambda \sqrt{f'_c} (c_{a1})^{1.5}$	$V_b = 1.9 \left(\frac{\lambda_e}{d_a} \right)^{0.2} \sqrt{d_a} \lambda \sqrt{f'_c} (c_{a1})^{1.5}$	$V_b = 7 \left(\frac{\lambda_e}{d_a} \right)^{0.2} \sqrt{d_a} \lambda \sqrt{f'_c} (c_{a1})^{1.5}$
Eq. D.25	V_b $= 0.66 \left(\frac{\lambda_e}{d_a} \right)^{0.2} \sqrt{d_a} \lambda \sqrt{f'_c} (c_{a1})^{1.5}$	$V_b = 2.1 \left(\frac{\lambda_e}{d_a} \right)^{0.2} \sqrt{d_a} \lambda \sqrt{f'_c} (c_{a1})^{1.5}$	$V_b = 8 \left(\frac{\lambda_e}{d_a} \right)^{0.2} \sqrt{d_a} \lambda \sqrt{f'_c} (c_{a1})^{1.5}$
Sec 6.1.8.1	$E_c = w_c^{1.5} 0.043 \sqrt{f'_c}$ $E_c = 4700 \sqrt{f'_c}$	$E_c = w_c^{1.5} 0.14 \sqrt{f'_c}$ $E_c = 15,100 \sqrt{f'_c}$	$E_c = v_c^{1.5} 33 \sqrt{f'_c}$ $E_c = 57,000 \sqrt{f'_c}$
Sec 6.1.9.1	$\lambda = \frac{f_{ct}}{(0.56 \sqrt{f'_c})} \leq 1.0$	$\lambda = \frac{f_{ct}}{(1.78 \sqrt{f'_c})} \leq 1.0$	$\lambda = \frac{f_{ct}}{(6.7 \sqrt{f'_c})} \leq 1.0$
Sec 6.4.1.2	$\sqrt{f'_c} \leq 8.3 \text{ MPa}$	$\sqrt{f'_c} \leq 27 \text{ kgf/cm}^2$	$\sqrt{f'_c} \leq 100 \text{ psi}$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Sec 6.4.3.4.3	$0.33\sqrt{f'_c}b_wd$	$1.1\sqrt{f'_c}b_wd$	$4\sqrt{f'_c}b_wd$
Sec 6.4.3.5.1(f)	$0.17\phi\sqrt{f'_c}b_wd$	$0.53\phi\sqrt{f'_c}b_wd$	$2\phi\sqrt{f'_c}b_wd$
Sec 6.4.3.6.9	$0.66\sqrt{f'_c}b_wd$	$2.2\sqrt{f'_c}b_wd$	$8\sqrt{f'_c}b_wd$
Sec 6.4.4.1(a)	$T_u < 0.083\phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)$	$T_u < 0.27\phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)$	$T_u < \phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)$
Sec 6.4.4.1(b)	$T_u < 0.083\phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1 + \frac{N_u}{0.33A_g\lambda\sqrt{f'_c}}}$	$T_u < 0.27\phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1 + \frac{N_u}{A_g\lambda\sqrt{f'_c}}}$	$T_u < \phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1 + \frac{N_u}{4A_g\lambda\sqrt{f'_c}}}$
Sec 6.4.4.2.2(a)	$T_u = \phi 0.33\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)$	$T_u = \phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)$	$T_u = \phi 4\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)$
Sec 6.4.4.2.2(b)	$T_u = 0.33\phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1 + \frac{N_u}{0.33A_g\lambda\sqrt{f'_c}}}$	$T_u = \phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1 + \frac{N_u}{A_g\lambda\sqrt{f'_c}}}$	$T_u = 4\phi\lambda\sqrt{f'_c}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1 + \frac{N_u}{4A_g\lambda\sqrt{f'_c}}}$
Sec 6.4.5.5	$(3.3 + 0.08f'_c)A_c$ $11A_c$ $5.5A_c$	$(34 + 0.08f'_c)A_c$ $110A_c$ $55A_c$	$(480 + 0.08f'_c)A_c$ $1600A_c$ $800A_c$
Sec 6.4.6.3	$0.83\sqrt{f'_c}b_wd$	$2.65\sqrt{f'_c}b_wd$	$10\sqrt{f'_c}b_wd$
Sec 6.4.7.3.2.1	$(3.3 + 0.08f'_c)b_wd$ $11b_wd$	$(34 + 0.08f'_c)b_wd$ $110b_wd$	$(480 + 0.08f'_c)b_wd$ $1600b_wd$
Sec 6.4.7.3.2.2	$(5.5 - 1.9\frac{a_v}{d})b_wd$	$(55 - 20\frac{a_v}{d})b_wd$	$(800 - 280\frac{a_v}{d})b_wd$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Sec 6.4.8.3	$0.83\sqrt{f'_c}hd$	$2.65\sqrt{f'_c}hd$	$10\sqrt{f'_c}hd$
Sec 6.4.8.5	$0.17\lambda\sqrt{f'_c}hd$	$0.53\lambda\sqrt{f'_c}hd$	$2\lambda\sqrt{f'_c}hd$
Sec 6.4.10.3.1	$0.17\lambda\sqrt{f'_c}b_o d$	$0.53\lambda\sqrt{f'_c}b_o d$	$2\lambda\sqrt{f'_c}b_o d$
Sec 6.4.10.3.2	$0.5\sqrt{f'_c}b_o d$	$1.6\sqrt{f'_c}b_o d$	$6\sqrt{f'_c}b_o d$
Sec 6.4.10.4.8	$0.33\sqrt{f'_c}b_o d$ $0.58\sqrt{f'_c}b_o d$	$1.1\sqrt{f'_c}b_o d$ $1.9\sqrt{f'_c}b_o d$	$4\sqrt{f'_c}b_o d$ $7\sqrt{f'_c}b_o d$
Sec 6.4.10.5.1	$0.25\lambda\sqrt{f'_c}b_o d$ $0.66\sqrt{f'_c}b_o d$ $0.17\sqrt{f'_c}$	$0.8\lambda\sqrt{f'_c}b_o d$ $2.1\sqrt{f'_c}b_o d$ $0.53\sqrt{f'_c}$	$3\lambda\sqrt{f'_c}b_o d$ $8\sqrt{f'_c}b_o d$ $2\sqrt{f'_c}$
Sec 6.4.10.5.2	$0.5\phi\sqrt{f'_c}$	$1.6\phi\sqrt{f'_c}$	$6\phi\sqrt{f'_c}$
Sec 6.4.10.5.4 & Sec 6.4.10.7.2	$0.17\phi\lambda\sqrt{f'_c}$	$0.53\phi\lambda\sqrt{f'_c}$	$2\phi\lambda\sqrt{f'_c}$
Sec 6.4.10.7.3 & Sec 6.9.4.10	$0.33\phi\lambda\sqrt{f'_c}$	$1.1\phi\lambda\sqrt{f'_c}$	$4\phi\lambda\sqrt{f'_c}$
Sec 6.12.5.3.1 & Sec 6.12.5.3.2	$0.55b_v d$	$5.6b_v d$	$80b_v d$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Sec 6.12.5.3.3	$(1.8 + 0.6\rho_v f_y) \lambda b_v d \leq 3.5 b_v d$	$(18 + 0.6\rho_v f_y) \lambda b_v d \leq 35 b_v d$	$(260 + 0.6\rho_v f_y) \lambda b_v d \leq 500 b_v d$
Sec 8.1.11.2(a)	$\frac{0.0018 \times 420}{f_y}$	$\frac{0.0018 \times 4200}{f_y}$	$\frac{0.0018 \times 60000}{f_y}$
Sec 8.2.2	$\sqrt{f'_c} \leq 8.3 \text{ MPa}$	$\sqrt{f'_c} \leq 26.5 \text{ kgf/cm}^2$	$\sqrt{f'_c} \leq 100 \text{ psi}$
Sec 8.2.3.2	$e_d = \left(\frac{f_y \psi_t \psi_e}{2.1 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{1.7 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{1.4 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{1.1 \lambda \sqrt{f'_c}} \right) d_b$	$e_d = \left(\frac{f_y \psi_t \psi_e}{6.6 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{5.3 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{4.4 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{3.5 \lambda \sqrt{f'_c}} \right) d_b$	$e_d = \left(\frac{f_y \psi_t \psi_e}{25 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{f_y \psi_t \psi_e}{20 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{3 f_y \psi_t \psi_e}{50 \lambda \sqrt{f'_c}} \right) d_b$ $e_d = \left(\frac{3 f_y \psi_t \psi_e}{40 \lambda \sqrt{f'_c}} \right) d_b$
Sec 8.2.4.2	$\left(\frac{0.24 f_y}{\lambda \sqrt{f'_c}} \right) d_b \geq (0.043 f_y) d_b$	$\left(\frac{0.075 f_y}{\lambda \sqrt{f'_c}} \right) d_b \geq (0.0044 f_y) d_b$	$\left(\frac{0.02 f_y}{\lambda \sqrt{f'_c}} \right) d_b \geq (0.0003 f_y) d_b$
Sec 8.2.6.2	$e_{dh} = \left(\frac{0.24 \psi_e f_y}{\lambda \sqrt{f'_c}} \right) d_b$	$e_{dh} = \left(\frac{0.075 \psi_e f_y}{\lambda \sqrt{f'_c}} \right) d_b$	$e_{dh} = \left(\frac{0.02 \psi_e f_y}{\lambda \sqrt{f'_c}} \right) d_b$
Sec 8.2.7.5(b)	$0.41 \frac{b_w s}{f_{yt}}$	$4.2 \frac{b_w s}{f_{yt}}$	$60 \frac{b_w s}{f_{yt}}$
Sec 8.2.10.2(b)	$0.17 \frac{d_b f_{yt}}{\lambda \sqrt{f'_c}}$	$0.053 \frac{d_b f_{yt}}{\lambda \sqrt{f'_c}}$	$0.014 \frac{d_b f_{yt}}{\lambda \sqrt{f'_c}}$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Sec 8.2.14.1	$0.071f_y d_b$ $(0.13f_y - 24)d_b$	$0.0073f_y d_b$ $(0.013f_y - 24)d_b$	$0.0005f_y d_b$ $(0.0009f_y - 24)d_b$
Sec 8.2.17.2	$\ell_{dt} = \left(\frac{0.19\psi_e f_y}{\sqrt{f'_c}} \right) d_b$	$\ell_{dt} = \left(\frac{0.06\psi_e f_y}{\sqrt{f'_c}} \right) d_b$	$\ell_{dt} = \left(\frac{0.016\psi_e f_y}{\sqrt{f'_c}} \right) d_b$
Sec 8.2.18.2	$\left(\frac{f_y - 240}{f_y} \right)$	$\left(\frac{f_y - 2460}{f_y} \right)$	$\left(\frac{f_y - 35,000}{f_y} \right)$
Sec 8.3.4.2(a)	$\frac{1.4b_w d}{f_y}$	$\frac{14b_w d}{f_y}$	$\frac{200b_w d}{f_y}$
Sec 8.3.5.4 & Figure 6.8.8	$s_o = 100 + \left(\frac{350 - h_x}{3} \right)$ $100 \text{ mm} \leq s_o \leq 150 \text{ mm}$	$s_o = 10 + \left(\frac{35 - h_x}{3} \right)$ $10 \text{ cm} \leq s_o \leq 15 \text{ cm}$	$s_o = 4 + \left(\frac{14 - h_x}{3} \right)$ $4 \text{ in.} \leq s_o \leq 6 \text{ in.}$
Sec 8.3.6.2(a)	$0.083A_{cv}\lambda\sqrt{f'_c}$	$0.27A_{cv}\lambda\sqrt{f'_c}$	$A_{cv}\lambda\sqrt{f'_c}$
Sec 8.3.6.2(b)	$0.17A_{cv}\lambda\sqrt{f'_c}$	$0.53A_{cv}\lambda\sqrt{f'_c}$	$2A_{cv}\lambda\sqrt{f'_c}$
Sec 8.3.6.6	$2.8/f_y$	$28/f_y$	$400/f_y$
Sec 8.3.6.7 (b)	$0.33\lambda\sqrt{f'_c}A_{cw}$	$\lambda\sqrt{f'_c}A_{cw}$	$4\lambda\sqrt{f'_c}A_{cw}$
Sec 8.3.7.3	$1.7\sqrt{f'_c}A_j$ $1.2\sqrt{f'_c}A_j$ $1.0\sqrt{f'_c}A_j$	$5.3\sqrt{f'_c}A_j$ $4\sqrt{f'_c}A_j$ $3.2\sqrt{f'_c}A_j$	$20\sqrt{f'_c}A_j$ $15\sqrt{f'_c}A_j$ $12\sqrt{f'_c}A_j$

Reference	SI-metric stress in MPa	MKS-metric stress in kgf/cm ²	U.S. Customary unit stress in pounds per square inch (psi)
Sec 8.3.8.3(f)	$0.67A_{cv}\sqrt{f'_c}$ $0.83A_{cp}\sqrt{f'_c}$	$2.12A_{cv}\sqrt{f'_c}$ $2.65A_{cp}\sqrt{f'_c}$	$8A_{cv}\sqrt{f'_c}$ $10A_{cp}\sqrt{f'_c}$
Sec 8.3.8.3(g)	$0.83A_{cp}\sqrt{f'_c}$	$2.65A_{cp}\sqrt{f'_c}$	$10A_{cp}\sqrt{f'_c}$
Sec 8.3.12.4	$0.29\sqrt{f'_c}b_o d$	$0.93\sqrt{f'_c}b_o d$	$3.5\sqrt{f'_c}b_o d$
Table 6.6.1	$(1.65 - 0.0003w_c) \geq 1.09$ $\left(0.4 + \frac{f_y}{700}\right)$	$(1.65 - 0.0003w_c) \geq 1.09$ $\left(0.4 + \frac{f_y}{7000}\right)$	$(1.65 - 0.005w_c) \geq 1.09$ $\left(0.4 + \frac{f_y}{100,000}\right)$

PART VI
Appendix B

Local Geology, Tectonic Features and Earthquake Occurrence in the Region

B.1 Seismotectonics and Earthquake Occurrence in and Around Bangladesh

B.1.1 General

Earthquakes are closely related to plate tectonics. Bangladesh is located in a tectonically active region close to the plate boundaries of the Indian plate and the Eurasian plate. The plate boundaries lie to the north and east of Bangladesh. The collision of the north-east moving (around 4 cm or more annually) Indian Plate with the Eurasian plate (Figure 6.B.1) is the cause of frequent earthquakes in the region comprising North East India, Nepal, Bhutan, Bangladesh and Myanmar.

Major thrust faults exist to the north (at the foot of the Himalayas) and to the east (in the Indo-Burma mountain ranges) of Bangladesh. Geologic evolution of the Bengal Basin is related to this collision. Bangladesh constitutes the major portion of the Bengal Basin. The collision perhaps started in the late Cretaceous and the Bay of Bengal and the Bengal Basin attained its present configuration at the end of middle Miocene orogeny.

Tectonically Bangladesh is divided broadly into three divisions: (i) Stable Shelf (in the northwest) (ii) Bengal Foredeep (in the Central) and (iii) Chittagong-Tripura Folded Belt (in the east). In addition there is a SW-NE trending 25 km wide hinge zone separating the Bengal Foredeep from the Stable Shelf.

The Stable Pre-Cambrian Shelf in the northwest consists of relatively thin sedimentary strata over bedrock. In Madhyapara area of Dinajpur the basement is only 130 m deep from the ground surface and is overlain by Dupi Tila Sandstone and Madhupur Clay of Plio-Pliocene age. The basement plunges gently from Madhyapara towards the southeast up to the Hinge Zone. Seismic contours on top of limestone in Bogra show regional dip of 2-3° besides revealing a number of NE-SW trending faults. The hinge zone is characterized by the sharp change in the dip of the basement rocks associated with deep-seated displacements in faults and is reflected on the gravity and magnetic anomalies. In the hinge zone, the depth of the limestone increases from 4000m to 9000m within a narrow zone of 25-km. Hinge Zone is connected with Bengal Foredeep by deep basement faults that probably started with the breakup of Gondwanaland. The SW-NE trending Hinge Zone turns to the east near Indian border in Jamalpur and seems to be connected with the Dauki Fault, probably by a series of east-west trending faults. Bengal Foredeep occupies the vast area between Hinge Line and Arakan Yoma Folded System in the east. The Bengal