APPENDIX B

EQUATIONS FOR COMPUTING THE ALLOWABLE WALL LOADS NEAR CENTER OF SLAB OR NEAR KEYED OR DOWELED JOINTS

$$P = 4\sigma_t \quad S\lambda$$

$$\sigma_t = 1.6\sqrt{f'_c}$$

$$S = \frac{bt_e^2}{6}$$

$$\lambda = \sqrt[4]{\frac{12k}{4EI}}$$

$$E = 57{,}000\sqrt{f'_c}$$

$$I = \frac{bt_e^3}{12}$$

$$b = 12 \text{ inches}$$

$$P = 4\left(1.6\sqrt{f'_c}\right)\left(\frac{bt_e^2}{6}\right)\sqrt[4]{\frac{12k}{4EI}}$$

$$= 4\left(1.6\sqrt{f'_c}\right)\left(\frac{12t_e^2}{6}\right)\sqrt[4]{\frac{3k}{57{,}000\sqrt{f'_c}(12t_e^3/12)}}$$

$$P = 12.8\sqrt{f'_c}\ t_e^2 \times \sqrt[4]{\frac{k}{19{,}000\sqrt{f'_c}\ t_e^3}}$$

f'_c = specified compressive strength of concrete, pounds per square inch

t_e = slab thickness, inches

k = modulus of subgrade reaction, pounds per cubic inch

Equations for Computing the Allowable Wall Load Near A Free Edge

$$P = \frac{\sigma_t \, S\lambda}{B_{\lambda x}}$$

$B_{\lambda x}$ = 0.3224 (point of maximum moment, see table in Beams on Elastic Foundations by M. Hetenyl)

$$P = 1.6\sqrt{f'_c}\left(\frac{bt_e^2}{6}\right)\frac{\sqrt[4]{\frac{12k}{4EI}}}{0.3224}$$

$$= 1.6\sqrt{f'_c}\left(\frac{12t_e^2}{6}\right)\frac{\sqrt[4]{\frac{3k}{57{,}000\sqrt{f'_c}\,(12t_e^3/12)}}}{0.3224}$$

$$P = 9.93\sqrt{f'_c}\,t_e^2\sqrt[4]{\frac{k}{19{,}000\sqrt{f'_c}\,t_c^3}}$$