

$$C_{T\theta_0} = \frac{\sigma a}{2} \left[\left(1 - \frac{e^2}{2R^2} \right) - \frac{\frac{\tan \delta_3}{3} \left(1 - \frac{e^3}{R^3} \right) \frac{\gamma}{8} \left(1 - \frac{4e}{3R} + \frac{e^4}{3R^4} \right)}{\left(1 + \frac{3e}{2R^2} + \frac{\gamma \tan \delta_3}{8} \right)} \right]$$

$$C_{T\theta_{1c}} = C_{T\theta_{1s}} = 0$$

$$C_{H\theta_0\theta_{1c}} = \frac{\sigma a}{2} \left(-\frac{A}{3} - \frac{D}{6} + \frac{BD}{6} \right) \quad \Bigg| \quad C_{H\theta_0\theta_{1s}} = \frac{\sigma a}{2} \left(\frac{B}{3} + \frac{AD}{6} \right)$$

$$C_{H\theta_{1c}} = \frac{\sigma a}{2} \left(-\frac{C}{6} - \frac{E\lambda_d}{6} + \frac{3A\lambda}{4} + \frac{BC}{6} + \frac{BE\lambda_d}{6} \right)$$

$$C_{H\theta_{1s}} = \frac{\sigma a}{2} \left(\frac{\lambda}{4} - \frac{3B\lambda}{4} + \frac{AC}{6} + \frac{AE\lambda_d}{6} \right)$$

$$C_{Y\theta_0\theta_{1c}} = -\frac{\sigma a}{2} \left(\frac{B}{3} + \frac{AD}{6} \right) \quad \Bigg| \quad C_{Y\theta_0\theta_{1s}} = -\frac{\sigma a}{2} \left(\frac{A}{3} + \frac{D}{6} - \frac{BD}{6} \right)$$

$$C_{Y\theta_{1c}} = -\frac{\sigma a}{2} \left(\frac{\lambda}{4} - \frac{3B\lambda}{4} + \frac{AC}{6} + \frac{AE\lambda_d}{6} \right)$$

$$C_{Y\theta_{1s}} = -\frac{\sigma a}{2} \left(\frac{C}{6} + \frac{E\lambda_d}{6} - \frac{3A\lambda}{4} - \frac{BC}{6} - \frac{BE\lambda_d}{6} \right)$$

$$C_{MH\theta_0} = 0$$

$$C_{MH\theta_{1c}} = \frac{\sigma a}{16} (A - B \tan \delta_3) \left(1 - \frac{e^4}{R^4}\right)$$

$$C_{MH\theta_{1s}} = \frac{\sigma a}{16} (1 - A \tan \delta_3 - B) \left(1 - \frac{e^4}{R^4}\right)$$

$$C_{MY\theta_0} = 0$$

$$C_{MY\theta_{1c}} = \frac{\sigma a}{16} (1 - A \tan \delta_3 + B) \left(1 - \frac{e^4}{R^4}\right)$$

$$C_{MY\theta_{1s}} = \frac{\sigma a}{16} (B \tan \delta_3 - A) \left(1 - \frac{e^4}{R^4}\right)$$

$$A = \frac{\left(\frac{Y}{8}\right)^2 \left(1 - \frac{4e}{3R} + \frac{e^4}{R^4}\right)}{\left(\frac{3e}{2R'} + \frac{Y}{8} \tan \delta_3\right)^2 + \left(\frac{Y}{8}\right)^2} \quad (31A)$$

$$B = \frac{\frac{Y}{8} \left(1 - \frac{4e}{3R} + \frac{e^4}{R^4}\right) \left(\frac{3e}{2R'} + \frac{Y}{8} \tan \delta_3\right)}{\left(\frac{3e}{2R'} + \frac{Y}{8} \tan \delta_3\right)^2 + \left(\frac{Y}{8}\right)^2} \quad (31B)$$

$$C = \frac{\frac{Y}{8} \left(1 - \frac{4e}{3R} + \frac{e^4}{3R^4}\right) \frac{C_{10}}{a} - \frac{Y}{6} \left(1 - \frac{3e}{2R} + \frac{e^3}{2R^3}\right) \lambda_i}{1 + \frac{3e}{2R'} + \frac{Y}{8} \tan \delta_3} \quad (31C)$$

$$D = \frac{\frac{Y}{8} \left(1 - \frac{4e}{3R} + \frac{e^4}{3R^4}\right)}{\left(1 + \frac{3e}{2R'} + \frac{Y}{8} \tan \delta_3\right)} \quad (31D)$$

$$E = \frac{\frac{Y}{6} \left(1 - \frac{3e}{2R} + \frac{e^3}{2R^3}\right)}{\left(1 + \frac{3e}{2R'} + \frac{Y}{8} \tan \delta_3\right)} \quad (31E)$$