

Calculate time to corrosion

$$T_{corr} = \frac{x^2}{4D_c} \left[\operatorname{erf}^{-1} \left(\frac{C_0 - C_{cr}}{C_0} \right) \right]^{-2}$$

Calculate the rate of corrosion

$$i_{corr} = \frac{37.5(1 - w/c)}{d_c}$$

Reduce size of rebar

$$d_{corr}(t) = d_{bi} - \frac{1.0508(1 - w/c)}{d_c} (t - t_{corr})^{0.71}$$

Obtain Level of Corrosion

$$CL = \frac{d_{bi} - d_{corr}(t)}{d_{bi}} * 100\%$$

Modify Mechanical Properties

$$f_{y,CL} = f_{yo} (1 - 0.021CL)$$

$$f_{u,CL} = f_{uo} (1.018 - 0.019CL)$$