The following equations closely approximate the AASHTO curves shown in Figure C14.7.6.3.3-1 in the AASHTO LRFD Bridge Design Specifications.

To evaluate the equations, stress should be in psi. The value for strain is in percent.

## **70 DUROMETER COMPRESSIVE STRAIN EQUATIONS**

Shape Factor(SF)  $\leq$  6.0

$$\varepsilon = C\sigma^x$$
  $C = 0.05 * \left(\frac{\sigma}{600}\right)^{0.15}$   $x = 0.65^{\left(\frac{SF}{6}\right)^{1.0 - 0.0004 * \sigma}}$ 

Shape Factor(SF) > 6.0

$$\varepsilon = C\sigma^{x} \qquad \qquad C = 0.5 * \left(\frac{\sigma}{1000}\right)^{0.5} \qquad \qquad x = 0.25 \left(\frac{SF}{12}\right)^{0.4}$$

## 60 DUROMETER COMPRESSIVE STRAIN EQUATIONS

Shape Factor(SF)  $\leq$  6.0

$$\varepsilon = C\sigma^{x}$$
  $C = 0.065 * \left(\frac{\sigma}{600}\right)^{0.15}$   $x = 0.60^{\left(\frac{SF}{6}\right)^{0.725}}$ 

Shape Factor(SF) > 6.0

$$\varepsilon = C\sigma^{x}$$
  $C = 0.65 * \left(\frac{\sigma}{1000}\right)^{0.5}$   $x = 0.25^{\left(\frac{SF}{12}\right)^{0.15}}$ 

## **50 DUROMETER COMPRESSIVE STRAIN EQUATIONS**

Shape Factor(SF)  $\leq$  6.0

$$\varepsilon = C\sigma^x$$
  $C = 0.10 * \left(\frac{\sigma}{600}\right)^{0.15}$   $x = 0.60^{\left(\frac{SF}{6}\right)^{0.725}}$ 

Shape Factor(SF) > 6.0

$$\varepsilon = C\sigma^{x}$$
  $C = 0.6 * \left(\frac{\sigma}{1000}\right)^{0.5}$   $x = 0.275^{\left(\frac{SF}{12}\right)^{0.15}}$ 

**Revisions:** June 2006

Added explanatory notes defining the intent of the equations and the units for stress & strain.

Feb 2012 Revised Figure reference to match 5<sup>th</sup> Edition Specifications.