

Common Expression to Combine Long Term Losses (French Code)

As per Clause No.: 3.3.2.4 of BPEL-83 & BPEL-91:

The Final Delayed Loss of Tension is taken to be equal to:

$$\Delta\sigma_d = \Delta\sigma_r + \Delta\sigma_{fl} + \left(\frac{5}{6}\right)\Delta\sigma_p$$

Where, $\Delta\sigma_r$ = Final Loss due to Shrinkage of concrete

$\Delta\sigma_{fl}$ = Final Loss due to creep of concrete

$\Delta\sigma_p$ = Final Loss of tension due to relaxation of prestressing steel

Commentary 3.3.2.4:

The loss of tension due to relaxation of the steel is reduced by the effects of shrinkage and creep of the concrete. It has been taken into account nominally in this relationship by reducing the value of the final relaxation of the steel by 5/6.

Variation of Combined Long Term Losses with Time

(as per French Code)

When the change in prestressing losses as a function of time has to be taken into account it can be assumed that the total value of the delayed losses Ds_{dj} evaluated j days after the tensioning of the group of tendons in question is governed by the following relationship:

$$\Delta\sigma_{dj} = r(j)\Delta\sigma_d \quad \text{where, } r(j) = \frac{j}{(j + 9r_m)}$$

wherein “ j ” is the age of the structure after tensioning.