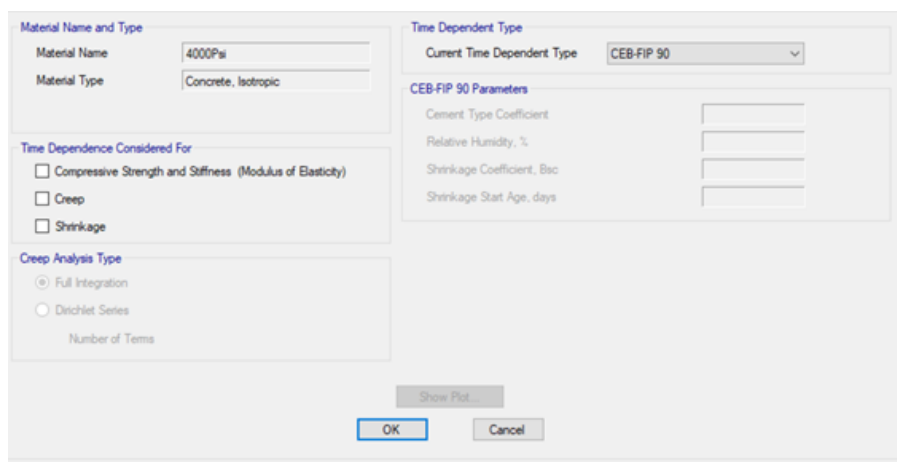


SHRINKAGE

Shrinkage is a time-dependent volumetric change associated with the drying and moisture transfer, thermal effects and gradients, and autogenous behavior (early-age chemical and structural reactions) of restrained reinforced-concrete (RC) systems. Shrinkage may cause aesthetic, serviceability, and even stability issues with the onset of cracking, curling/warping, and reduced load-carrying capacity.



The screenshot shows a software dialog box with the following sections:

- Material Name and Type:** Material Name: 4000Psi, Material Type: Concrete, Isotropic
- Time Dependence Considered For:**
 - Compressive Strength and Stiffness (Modulus of Elasticity)
 - Creep
 - Shrinkage
- Creep Analysis Type:**
 - Full Integration
 - Dirichlet Series
 - Number of Terms: _____
- Time Dependent Type:** Current Time Dependent Type: CEB-FIP 90
- CEB-FIP 90 Parameters:**
 - Cement Type Coefficient: _____
 - Relative Humidity, %: _____
 - Shrinkage Coefficient, Bsc: _____
 - Shrinkage Start Age, days: _____

Buttons at the bottom: Show Plot, OK, Cancel.

Restraint conditions that affect shrinkage behavior may be external, as with supports, connections, and boundary conditions, or internal, as with differential drying and reinforcement. Shrinkage cracking is mitigated with increased amounts of reinforcement at decreased spacing, and with the inclusion of coarse aggregate, which is dense, hard, and less compressible. The proper early-age handling and curing of concrete further mitigates shrinkage while enhancing long-term life expectancy and structural performance.