Creep FAQ

This page is devoted to frequently asked questions (FAQ) related to creep.

On this page:

How is creep modeled?

**Answer:** There are several ways to model creep deformation. Depending on design intention, two options are as follows:

- If only final creep deflection is of interest, a simple static analysis with reduced material stiffness for concrete slab objects is sufficient. The convenient way to do this is to use the stiffness modification factors available on the Define > Frame Sections or Area Sections > Modify/Show Property > Set Modifiers > Frame Property/Stiffness Modification Factors menu.

- If creep behavior is to be modeled over time, time-dependent properties may be defined for concrete on the Time Dependent Properties for Concrete menu. Nonlinear staged-construction analysis may then be run to generate results.

How is creep calculated when applied load varies with time?

**Expanded question:** Some uncertainty exists concerning the Age of Loading relevant to material definition. As a tower is built, column load and Age of Loading both vary. Therefore different creep functions should be used to compute creep contribution from additional load which is applied with each construction stage. How is this progression in Age of Loading ($t_0$) implemented when different creep functions characterize a succession of loads?

**Answer:** Creep is calculated separately for each stress increment. This accounts for the progression of the creep function and the stresses due to nonlinear loading. Please see the Creep implementation article for further details.

What are the creep coefficients for nonlinear (long-term cracked) analysis?

**Answer:** Creep coefficients are equivalent to the ACI 9.5.2.5 time-dependent factors for sustained loading, in which a creep coefficient of 2.0 corresponds to 5 years or more, 1.4 corresponds to 12 months, etc.

- The method implemented within CSI Software is based on Ghali, A., Favre, R., Elbadry, M. (2002). (3rd ed.). London, England: Spon Press., which is similar to that of ACI 435R Appendix B, in which creep factors are analogous to those of ACI 318.

- Verification example 16, available through Help > Documentation, is also available for additional details on creep and its formulation.