DOWNLOAD PDF SAFE SLAB DESIGN EXAMPLE

Chapter 1 : Cracked-section analysis - SAFE - Computers and Structures, Inc. - Technical Knowledge Bas

SAFE provides an immensely capable yet easy-to-use program for structural designers, provideing the only tool necessary for the modeling, analysis, design, and detailing of concrete slab systems and foundations.

How are cracked sections analyzed in SAFE? Two types of cracked-section analysis are available, including: Immediate cracked deflection Long-term cracked deflection accounting for creep and shrinkage Cracked-section analysis is run in SAFE using either of the following two methods: All load patterns are applied in a single load case which uses either immediate or long-term cracked deflection, discussed as follows: Long-term cracked deflection, in which analysis is divided into the following two categories: Non-sustained portion, in which cracked-section analysis considers only the non-sustained portion of LIVE load, solving for incremental deflection. Creep and shrinkage are included only in this sustained portion of analysis because these effects are only applicable under sustained loading. Analysis proceeds as follows: The difference between Case 1 and Case 2 represents the incremental deflection without creep and shrinkage due to non-sustained loading on a cracked structure. The procedure indicated above results on total long term deflection over time. Most engineers simply check this values against ACI Table 9. In order to remove portion of dead load deflection occurring before attachment of nonstructural elements, the following procedure can also be used: We recommend this method, though an alternative is available, described as follows: A single load pattern is applied in a load case, then another case is set to continue From State at End of Nonlinear Case. The DEAD load case predicts cracking from a zero initial condition, in which no load is present, then computes cracking due to DEAD load-pattern application. Cracked-slab deflection SAFE can use user-defined reinforcement to compute cracked-slab deflection. Select Draw Slab Rebar from the vertical menu on the left. Note that rebar must be added in both the tension and compression regions for the entire slab since the software will only use the user-defined reinforcement, and not use the reinforcement design. References Refer to watch and learn video: Cracked section analysis During nonlinear cracked-section analysis, SAFE estimates deflection using a moment-rotation curve as described in the reference which follows: