

# **Using Maturity to Predict Girder Camber**

by

**Stephen M. Bert**

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**APPROVED:**

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**Carin Roberts-Wollmann**

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**Thomas E. Cousins**

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**Richard E. Weyers**

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## (ABSTRACT)

The objective of this research was to determine if differential camber of prestressed concrete girders could be reduced by accurate prediction of initial camber at release of prestress. Maturity at prestress transfer was used to calculate modulus of elasticity for predicting camber at release. The research consists of a literature review of maturity methods, testing of a standard concrete mix to determine strength and modulus functions and measurement of girder camber and maturity.

Both the Nurse-Saul and the Arrhenius maturity models were evaluated. Maturity relationships were developed for concrete mixes containing Type II and Type III cements. A relationship of modulus as a function of maturity was developed. Seven girders were tested. Camber predictions within 0 to  $\frac{1}{4}$  in. of actual camber were obtained using modulus of elasticity calculated from a maturity based function. Comparison was made between maturity based modulus and standard strength based modulus models. Camber predictions based on modulus calculated based on field cured cylinder strengths were within 0 to  $\frac{1}{2}$  in.

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