

**PROPOSITION OF BACKCALCULATION METHODOLOGY TO
ESTIMATE THE STRUCTURAL BEHAVIOR OF ASPHALT
PAVEMENTS WITH CEMENT TREATED BASES**

Santi Ferri *

MsC. Student of University of São Paulo, Civil Engineer of Planservi

Carlos Yukio Suzuki

Professor PhD. of the Civil Engineering School of the University of São Paulo,
Civil Engineer of Planservi Engenharia Ltda.

Caio Rubens Gonçalves Santos *

PhD. Student of University of São Paulo, Civil Engineer of Planservi

Flaviane Melo Lopes

MsC. Student of University of Campinas, Civil Engineer of Planservi

* Planservi Engenharia Ltda. Av. Professor Ascendino Reis, 725, CEP: 04027-000, São Paulo, Brazil, santi@planservi.com.br.

ABSTRACT

This paper proposes a method for resilient moduli backcalculation, based on structural responses from the Elsym-5 software. Over 8.800 cases of 3 layer system pavements were simulated varying the resilient moduli and thicknesses. The simulations were performed recovering deflections in order to characterize the entire deflection basin. In addition, horizontal normal stresses and strains of each layer were determined. Using deflection data, correlations were conducted to obtain mathematical models for estimating the cement treated base resilient modulus value using deflection parameters. Also, a database of deflections and stress values was created in addition to an Excel® routine that retrieves these values, comparing them with field deflection measurements, in order to perform the best-fit iterative procedure. A study case was conducted by using deflection data collected with FWD equipment and additional research project data to estimate the deterioration factor in soil-cement bases. It was observed that there is a good convergence between the estimated values by statistical models and the best-fit procedure. The results indicated that the proposed process represents an important tool for structural evaluation of cement treated bases as well as the entire pavement structure.

KEY WORDS: Asphalt Pavement, Cement treated bases, Backcalculation.