

Random Number simulation for the Correlation between the Allowable stress design and the Reliability Analysis

O. Yoshida¹⁾

¹⁾Yoshida Engineering Laboratory, Chiba City 262-0019, Japan,
GFD03112@nifty.ne.jp

Keywords: *Performance-based Design, Probability density distribution, Reliability Index*

Abstract

This paper visualizes the probability distributions which are in the background of the allowable stress design code of the bridges. Random vehicle weight samples are generated as for several Traffic Flow Models, and they comprise random arrayed motorcades. Various traffic loads for a lane are calculated, and their variances are obtained. Thus the girder stress dispersion is identified as the action side distribution. Reliability Assessment of the Bridge Girder can be carried out through the convolution of this action stress distribution and the yield stress distribution. Accordingly, the allowable stress design method can be converted to the Reliability analysis design. This Reliability Assessment for the Bridge Girder which is designed according to the allowable stress method derives Reliability Index about 6.0. The fragility of this assessment does not include the uncertainties such as an aged damage or the error. Then the deterioration probability is assumed and the random samples of defects are generated. A new reliability assessment for the uncertainties is intended.

References

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