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Determination of Stay Cable Force Based on Multiple Vibration Measurements to Consider the Effects of Uncertain Boundary Constraints

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Due to its simplicity, the vibration method is commonly adopted to determine the cable force by first identifying the cable frequencies from the vibration signals. With given vibration length and flexural rigidity, an analytical or empirical formula is then used with these cable frequencies to calculate the cable force. It is, however, usually difficult to decide the two required parameters, especially the vibration length due to uncertain boundary constraints. To tackle this problem, a new concept of further incorporating the mode shape ratios of cable is introduced in this study to develop a convenient method for the determination of stay cable forces considering the effects of complicated boundary constraints. This new method is verified with practical applications in estimating the cable forces of Chi-Lu Bridge.

Ключевые слова:

Содержание.

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