



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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**Effect of Vehicle Vibrations on The Dynamic
Response of Inclined Bridge Spans**

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2 STATEMENT

This thesis is submitted to Ain Shams University for the degree of M.Sc. in Civil Engineering.

The work included in this thesis was carried out by the author at the Department of Structural Engineering, Faculty of Engineering, Ain Shams University, Cairo, Egypt.

No part of this thesis has been submitted for a degree or a qualification at any other University or Institution.

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Research Title:

**Effect of Vehicle Vibrations on The Dynamic Response of
Inclined Bridge Spans**

ABSTRACT

This research work deals with the problem of the effect of the interaction between the vehicle and bridge on the bridge dynamic response. A software program was modified and used to solve this dynamic problem using the concepts of substructuring and matrix condensation. A complex vehicle model was used to represent the vehicle components very closely.

A parametric study was performed on the Kilo 21 bridge which locates on Alexandrie-Matruh Highway Road to study the effect of different factors affecting the bridge vehicle interaction such as the bridge entrance and exit slopes, bridge continuity, vehicle speed, bridge damping, and the existence of surface irregularities at the bridge entrance and expansion joints with a special emphasis was placed on the effect of the bridge entrance and exit slope

Another design was performed by Author for the kilo 21 bridge to study the effect of the bridge construction type on DAF values. The bridge was designed as steel beams acting with the concrete slab as a composite section and a comparison was made between DAF values for both types of bridge.

The Dynamic Amplification Factors (DAFs) were computed based on the results of the analysis and a comparison was made between DAFs obtained through the analysis and DAFs specified in The Egyptian Code of Practice. Based on this comparison, a number of special considerations were recommended to be taken in the design of bridges under the different studied parameters.

KEYWORDS: Dynamic Response, Vehicle-Bridge interaction, Entrance and Exit Slopes, Dynamic Amplification Factors, Substructuring.

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