شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

جامعة عين شمس

شبكة المعلومات الجامعية

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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MONA MAGHRABY

Ain Shams University

Faculty of Engineering

Structural Engineering Department

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

A Thesis Presented by

Osama Mohamed Mohamed Mantawy

B.Sc. of Structural Engineering.

Civil Engineering Department - Ain Shams University,2014

Supervised by:

Prof. Dr. Hisham Ahmed El-Arabaty

Professor of Structural department

Faculty of Engineering

Ain Shams University

Dr. Saleh Al-Mekawy

Assistant Professor of

Structural Engineering

Ain Shams University

Dr. Nasr Eid Nasr

Associate Professor of

Structural Engineering

Ain Shams University

2021

Ain Shams University
Faculty of Engineering
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Examiners Committee

Prof. Dr. Hala Mohamed Gamal Eldin Elkady ……………………..

Professor of Civil Engineering Department

National Research Center

Prof. Dr. Mohammed Nour El-Din Saad Fayed ……………………..

Professor of Structural Engineering

Ain Shams University

Prof. Dr. Hisham Ahmed El-Arabaty ……………………..

Professor of Structural Engineering

Ain Shams University

Dr. Nasr Eid Nasr ……………………..

Associate Professor of Structural Engineering

Ain Shams University

Date: 4/9/2021

1 CURRICULUM VITAE

Name	Osama Mohamed Mohamed Mantawy
Date of Birth	23, March 1992
Place of Birth	Egypt
Scientific degree	B.Sc. of Structural Engineering, Faculty of Engineering, Ain Shams University, 2014
Current Job	Demonstrator of Structural Engineering, Structural Engineering Department, Faculty of Engineering, Ain Shams University

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.

Name: Osama Mohamed Mohamed Mantawy

Signature:

Date: 4 /9/ 2021

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Ain Shams University
Faculty of Engineering
Department of Structural Engineering

Researcher Name: Osama Mohamed Mohamed Mantawy

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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