

Minimize Nearby Structure Damage Issues in Road Construction

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Abstract

The purpose of this research is to minimize the nearby structure damage issues in road construction. Vibration caused various types of structural damages and it may finally affect the project progress. Although, there are systems to control these issues, it is reported that available systems are not reliable, effective and systematic. Even though, there are many research studies about quantitative vibration studies, nobody presented systematic holistic solution for these problems. Objective of this research is to minimize the nearby structure damage issues in road construction and improve sustainability of road construction projects. Firstly, existing vibration and structure damage monitoring systems of Sri Lanka and other countries were studied. Secondly data regarding existing system from experience site and Highway engineers were collected. Finally vibration when do major vibration generation road construction activities which used heavy vibrator rollers were monitored.

Damages due to vibration depends on structure type, vibration value and affected time period. Those factors are taken into account to establish a systematic method. This method and guideline will provide fair solution to both parties who affected with vibration consequences and construction. For the survey, it is used hilly terrain area road section with similar subgrade condition.

On the basis of the results of this research, it can be concluded that vibration limits are exceeded its damage limits in nearby structure and current boundary limits are not in optimum range and it should change with structure condition and bearing capacity . According to questionnaire survey 84 % engineers think existing system should improve to meet sustainable road development and 85% engineers think vibration monitoring system is required for construction activities. This research generated three major outcomes which are very valuable to road construction sector. Those are vibration contour map for various type of compaction activities. Secondly, guideline for contractors and affected parties and data of deciding vibration affected boundary for specific road construction project.

Key words: Vibration, Compaction, Structure.

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