

## **Determination of construction vibration & noise effect extent**

Dhanushka Meegaswatte\*

**\*Corresponding author: [dsm2mail@gmail.com](mailto:dsm2mail@gmail.com)**

With the *Global Village* concept contemporary mankind started to share technology, knowledge, strategies etc. among the nations. As a result of exposing to such innovative atmosphere people started to seek competitive development notwithstanding the economic category of them. Consequently development projects have become a basic need of a nation.

This case study clearly based on a construction stage of Outer Circular Highway development project which was executed by government of Sri Lanka in collaboration with Japan International Cooperation Agency (JICA). This expressway runs 8.9 km from Kadawatha to Kaduwela and it is one of the phases of Outer Circular Highway to the city of Colombo. Construction works of this project was commenced on 09.01.2012 and the facility was opened for public on 17.09.2015.

At the planning stage of this project, RDA recommended to identify and declare 50m corridor from the boundary of the project area to outside on both side of the road during the construction phase which is known as "Impact Area". The main purpose of establishing such impact area was to avoid controversial social issues which arise due to property damages. Foremost cause of property damages is Vibration which derives from construction activities. Anyhow end of the project all houses, buildings which locate within this impact area were subjected to a damage evaluation process and properly compensated.

Main objective of this case study is justification of allocation of 50m corridor as impact area because so far a rational explanation has not been provided to prove the adequacy of 50m width. In this study monitoring data which gathered during entire construction stage (three and half years) were used in order to build a correlation among vibration effect and the distance.

During the construction stage a qualified team had been deployed for the monitoring purpose. Noise and Vibration levels were measured randomly and complain basis (once a complain received regarding excessive noise or vibration, the monitoring team visits particular location and performs monitoring). Each measurement was recorded with its corresponding offset (distance from the activity to monitoring location). Noise and vibration monitoring was carried out for 3 years in that manner. Entire monitoring data were filtered into each significant construction activity and arranged them monthly wise of each year.

In the vibration level analysis of each construction activity, highest vibration level which was recorded during each month was plotted against the corresponding offset. Although same correlation was applied for noise level analysis, lowest noise level of each month was used apart from the highest record of each month. Since this study

deals with two-dimensional variables a *Trend Line* is determined in order to identify the tendency of the trend. This developed trend line gives assistance to determine the adequacy of buffer zone allocation.

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