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EFFECT OF TRENCHING ON BLAST-INDUCED GROUND VIBRATION IN SRI LANKAN METAL QUARRIES

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University of Moratuwa
Sri Lanka

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**EFFECT OF TRENCHING ON BLAST-INDUCED
GROUND VIBRATION IN SRI LANKAN METAL
QUARRIES**

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138458c

Thesis submitted in partial fulfillment of the requirements for the degree Master of
Science in Mining and Mineral Exploration

Department of Earth Resources Engineering

University of Moratuwa

Sri Lanka

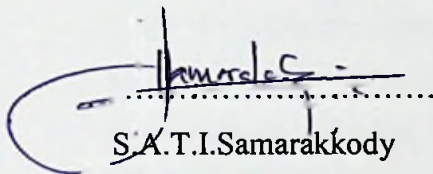
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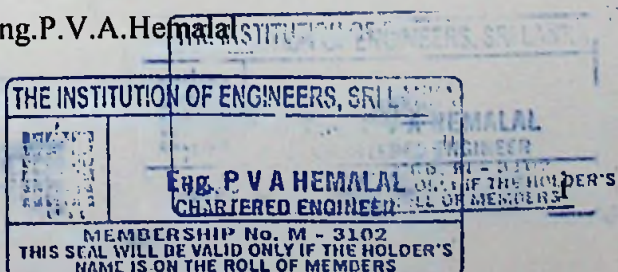
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ABSTRACT

Problems due to ground vibration are a matter of serious concern for the users of explosives. It is not possible to eliminate vibration completely or to contain them at the source. Effort need to be made in controlling them within safe level, without effecting the production schedules and economic viability of the project. When predicted or monitored vibration exceeded the statutory limit, ground vibrations are generally controlled by modifying the blast design parameters. In critical situation, digging a trench has reduced ground vibration. The extent to which it can reduce ground vibration has been examined by field experiments at a open cast quarry mine located at Arankele in Sri Lanka.

After selecting a suitable quarry site at Arankale off Kurunagala in North-Western province of Sri Lanka. Suitable place for blasting face, digging a trench and observation point have been identified.

Vibration measurement were carried out after single shot hole blasting method prior to digging a trench and after digging the trench with variation of depth of drill holes and depth of the trench, at points located just before the trench(A), just after the trench (B) and approximate observation point away from the trench (C).

Average of ten single shot hole blast carried prior to digging trench show ground vibration reduction percentage are 6.326% ,1.23%, 7.023% and 18.309% at B, and 72.262%, 54.474%, 55.183%, and 45.191% at C.

Results after digging the trench show ground vibration reduction percentages are 57.878%, 53.946%, 40.514% and 36.757% at B and 55.509%, 64.787%, 56.848% and 42.382% at C.

Such results indicate, just after the dug trench, ground vibration reduction level is very much higher compared to the results obtained before digging the trench. However considerable deferences have not been observed at the observation point under same condition. The results also show that the percentage of the reduction depend on the trench depth to blast hole depth ratio.

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