Talk on Blast-Induced Vibration in Tunnelling Using Barrier Holes and Air-Deck

by Dr Rini Asnida Abdullah

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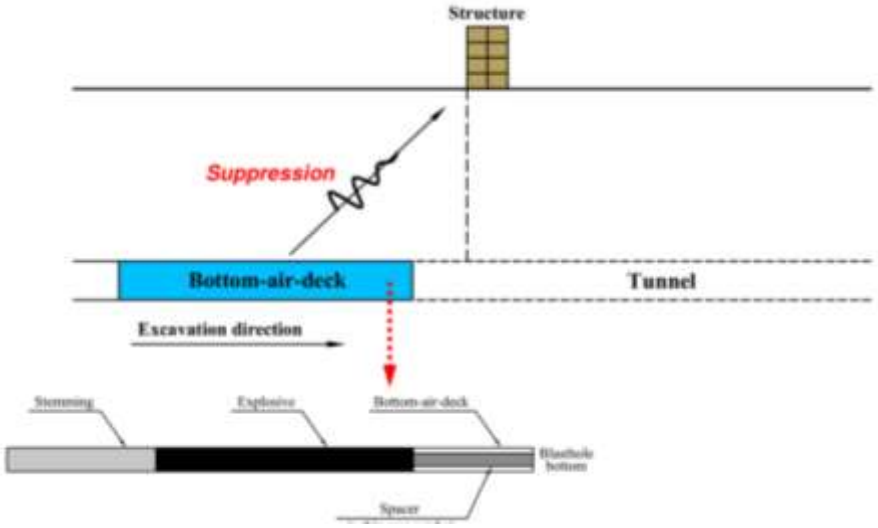
The talk on the Reduction of Blast-Induced Vibration in Tunnelling, Using Barrier Holes and Air-Deck, was held on 16 February 2016 at Wisma IEM.

The speaker was Prof. Seokwon Jeon, Civil and Environmental Engineering at the Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea.

Prof Jeon is the Vice President (Asian) of the International Society for Rock Mechanics (ISRM). The talk was attended by 40 participants.

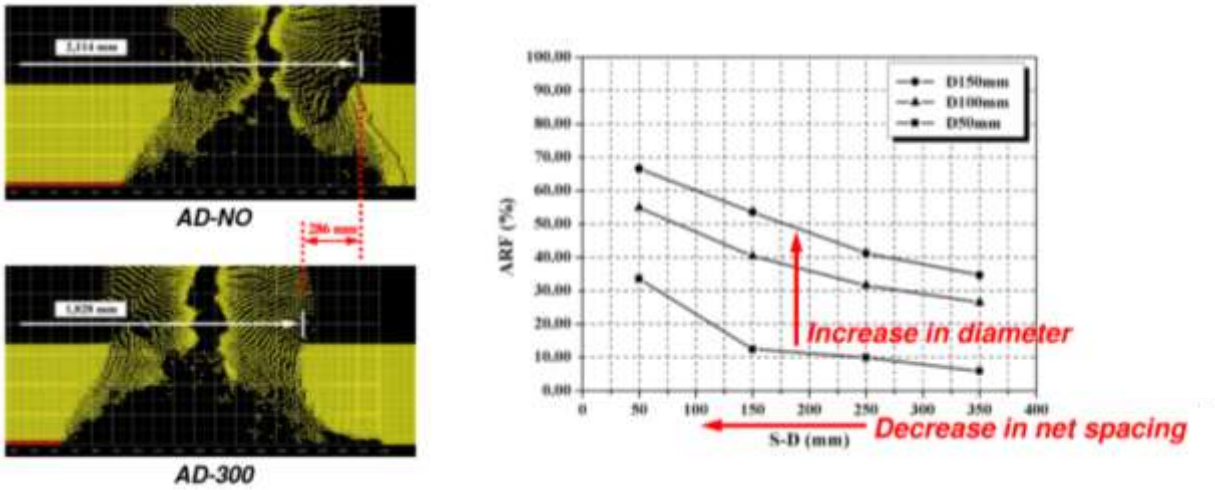
Two different approaches of blasting techniques to reduce blast-induced vibration in tunneling were discussed, i.e. the application according to the location of nearby structures, and line-drilling and bottom-air-deck.

An air-deck, which is located at the bottom of blasthole, is assumed as bottom-air-deck. Using this technique, the initial pressure which is transmitted to the surrounding ground through the bottom of blasthole is reduced, and the distance from blasting source to a structure, increases.



Application of bottom-air-deck

The effectiveness of both methods is evaluated using numerical investigations based on a non-linear hydrocode, which is often used to numerically modelled and solved high-velocity impacts problems such chemical explosives. The effect of spacing and diameter of blasthole ground vibration have been successfully modelled. In general, the vibration-reduction effect increases with decreasing the spacing of drill holes and with increasing the diameter of drill holes.



Numerical simulation of Bottom-air-deck

Field experiments indicate that both methods can effectively reduce blast-induced vibration according to the location of structures. From the present numerical and experimental study, Prof. Seokwon Jeon stated that when both methods were applied in tunnel excavation, the vibration-reduction effects could be expected. Thus based on the numerical results, design conditions of both methods for the reduction of blast-induced vibration in tunneling were proposed by introducing the concept of factor of safety. (285 words)

Prof. Jeon delivering his talk

Presentation of momento to Prof Jeon Seokwon