

DEVELOPMENT OF DUST REDUCTION TECHNIQUES IN THE TUNNEL CONSTRUCTION WITH DIGGING MACHINES

Abstract : A study was conducted using a full-scaled tunnel simulation at our Construction Environment Laboratory (100 meter-long, cross-sectional area 80 square meters). From the results of the study, correlation between dust concentration and construction conditions was analyzed by multiple linear regression analysis. Moreover, various kinds of dust reduction technology were applied, and those dust reduction effects were checked. As a result, it was found that (1) the result of the multiple linear regression analysis about the factor affecting the dust concentration found that the most influential factor causing dust concentration was "Unconfined Compressive Strength", and "Number of Watering Nozzles", "Digging Speeds", and "Amount of Watering", arranged in order of influence., (2) The various kinds of dust reduction techniques were applied and those dust reduction effects were examined. As the result, the elastic ventilation ducting was most effective. This result shows that it is very effective to collect the dust near the tunnel face before the dust diffuse.

Key words : Tunnel, Dust Reduction Techniques, Machine Digging, Multiple Linear Regression Analysis