

Construction site noise modelling using stochastic techniques

Abstract

The prediction of noise arising from a construction activity represents a problem when a number of different processes are carried out at different times in the course of the working day. These typically involve the use of powerful machines that have correspondingly high sound power levels [1]. The nature of the sources, coupled with the limited opportunities for the screening of neighbouring sensitive locations from the noise generated, means that complaints often arise from such activities. Problems can be avoided if noise levels arising from these activities can be controlled to comply with the noise limits specified by the local authority at the planning stage. This requires the application of a suitable noise prediction technique, however, the noise experienced at a receiver is affected by factors such as movement of machinery around the site, the operational characteristics of the machinery, distance from the site, ground cover, screening and meteorological conditions. At the planning stage the data regarding these factors are very granular

Current prediction procedures give the typical equivalent noise level (L_{eq}) corresponding to the working day. However, this quantity yields no information regarding the temporal or statistical variation in noise levels arising from site operations. Although L_{eq} , because of its relative ease of use for prediction purposes, has become a preferred unit for environmental noise measurements and standards, the importance of temporal variations on subjective response was recognized in the early days of environmental noise research and a number of complex noise units were proposed which involved temporal parameters. The temporal variation of environmental noise has also been recognized in contemporary work on soundscape where measurements of short L_{eq} are often made and sometimes presented in the form of statistical data[3]. This chapter dealt with the basis of a prediction using stochastic techniques namely Monte Carlo and probability technique.