

Rungrut Dermsuntie 2006: Performance of Temporary Noise Barrier of Noise Reduction from Construction Site. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Jakkris Sivadechathep, Ph.D. 101 pages. ISBN 974-16-2192-2

Performance of temporary noise barrier in reducing noise from a construction site was determined using 4 types of materials namely galvanized plate, plywood, paper egg holders and fabric material. Three types of construction machine were tested such as jack hammer, piling rig and backhoe. The experiments were set up to measure efficiency of noise transmission, absorption and reduction by using an integrated noise source. The experiment comprised 2 steps as follows: Step 1: Measurement of efficiency of temporary noise barrier in the laboratory by using recorded construction noise. Step 2: The best two types of the temporary noise barrier were then taken for field measurement. It was found from the laboratory test that fabric material had the maximum noise reduction efficiency in both transmission and absorption of 3 construction machine. The rest can be described in the descending order as plywood, galvanized plate and paper egg holders, respectively. Any noise barrier had different noise reduction efficiency depending on noise frequency of each construction machine. The frequency which made the highest noise levels from jack hammer and piling rig was 2,000 Hz while that from backhoe was 500 Hz. The frequency which all 4 types of noise barrier were able to absorb best was 500 Hz. When considering each material, it was found that fabric material and paper egg holders reduced noise level by absorption. Both fabric material and paper egg holders had rather high noise absorption coefficients of the 3 construction machine as 0.8640 ± 0.0104 and 5104 ± 0.0141 . Noise reduction efficiency of plywood and galvanized plate was achieved by reflection due to their relatively low noise absorption coefficient as follows: 0.3859 ± 0.0228 and 0.2615 ± 0.0092 , respectively. Noise reduction efficiencies of fabric material, plywood, galvanized plate and paper egg holders were 20.3333 ± 0.4163 16.4333 ± 0.2082 16.90 ± 0.30 12.1333 ± 0.4041 dB(A), respectively. The field measurement showed that noise reduction efficiencies of fabric material and plywood were not consistent. Fabric material was able to well reduce noise from jack hammer and backhoe while plywood could well reduce noise from piling rig. However, the measurement conditions were not well controlled due to disturbance from other activities and limitation in fixing both the temporary noise barriers and measurement devices. To apply the noise barriers requires installation such as fixing around the construction machine or an area where direct noise receptors.

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26 / May / 2006