A study of piezoelectric as electric transducer on asphalt pavement

ABSTRACT

Electricity is a major source of necessity in human life nowadays. Renewable and clean energy resources have become a demanded research area due to the problems facing energy shortage. Piezoelectricity is a type of technology used for electrical energy harvesting from mechanical pressure such as mechanical efforts of the vehicles. The objectives in this study is to determine the best type of piezoelectric, the instalment method of piezoelectric under the asphalt pavement and to observe the value of voltage produced. This study has been undertaken as systematic literature review (SLR) to collect the data and results from previous study. This study starts with identification process to find out the related journals to the topic and continued with screening process. The last is eligibility process which is important to achieve the objectives of this study. The results show that PZT5H is the best type of piezoelectric transducers because it can generate more energy and suitable for harvesting energy. The most depth used for the installation of this piezoelectric transducer is 40mm depth under the asphalt. This asphalt pavement has an ability to absorb higher energy from mechanical movement and 40mm depth is the best location to embed the piezoelectric transducer with vertical spacing 2.5m and horizontal spacing 1.875m in order to ensure the wheel fully acting on the piezoelectric transducer. The voltage value in this study is not same with each previous study because different load produced different voltage even use the same PZT and same depth.