

Fiber Optic as Embedded Sensors to Failure Detection of Beam Green Concrete

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Abstract	Concrete is one of the materials widely used in the construction field because of its strength and durability. But still this material will experience a decrease in quality even damage due to environmental influences such as pressure. It is very important to monitor the condition of the concrete and provide early warning to be able to know if there is damage to the concrete. This study aims to utilize singlemode fiber optic as an embedded beam failure sensor. Concrete failure detection systems are designed to read signals from fiber optics and define beam failure status. To achieve this goal, straight configuration of optical fiber is planted in reinforced beam concrete. In this study three reinforced beam concrete were made with aggregates from plastic waste. Design The concrete damage detection system consists of photodiode, Arduino and LCD. The beam press test is carried out with universal testing machine. From the results of data analysis, it was found that the value of the concrete beam began to fail when the defect reached 4.7 mm This value is achieved when the output voltage of beam failure detection system is 2.6 volts. The system test results are when the output voltage is less than 2.6, the alarm status is off and when the output voltage is greater than 2.6 volts, the alarm status is on which indicates the beam has failed.
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