

A Wireless Based StormPAV Green Pavement Moisture Monitoring System

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J. Annisa; L. C. Eng; N.T. Razali; D.Y.S. Mah; M.A. Mannan [All Authors](#)

2
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Abstract

Document Sections

- I. Introduction
- II. Methodology
- III. Design and Implementation
- IV. Results and Discussion
- V. Conclusion

Authors

Figures

References

Keywords

Metrics

Abstract:

Concrete provides the foundation for the key systems in most construction projects mainly roads and buildings. For concrete, water is a key ingredient in the hydration process that sets and cures the cement portion of any concrete blend. However, if the excess water or moisture content is not given time to leave the slab, it will cause damage. This research focused on developing a moisture sensor monitoring system for StormPAV green pavement concrete which uses wireless data transfer to the processor. The monitoring system used Arduino as its operating system, dielectric constant concept to monitor the moisture content of the concrete, XBEE Pro as a tool for wireless data transfer, and Node RED software for data collection, monitoring, and analysis. Control experiment was carried out to determine the suitable method for measuring the moisture of the concrete. From the control experiment, it was convinced that the moisture content of the concrete could be determine by its dielectric constant. The performance of this developed system was validated by observing ten samples of freshly form concrete. It was found that the average days for the concrete to be completely dry which is on the 19th to 20th day. This proved that the time to wait before curing could be shortened to increase the productivity for concrete production rather than using the conventional estimation curing period which had been practiced formerly. Thus, the developed moisture sensor monitoring system which utilized low cost materials, low technological complexity, wireless data transfer and also sufficient sensitivity can be employed in concrete industry in wide-ranging.

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