

Wireless Construction Strength Monitoring System for Estimating Concrete Strength by the Maturity Method

Ju-Yong Kim¹, Youngje Sung², Sanghee Kim³, Gwang-Hee Kim^{4*}

¹ Ph.D. Candidate, Department of Architectural Engineering, Kyonggi University, South Korea, E-mail address: ju2020@kyonggi.ac.kr

³ Professor, Department of Electronic Engineering, Kyonggi University, South Korea, E-mail address: yisung@kgu.ac.kr

³ Professor, Department of Architectural Engineering, Kyonggi University, South Korea, E-mail address: sanghee0714@kyonggi.ac.kr

⁴ Professor, Department of Architectural Engineering, Kyonggi University, South Korea, E-mail address: ghkim@kyonggi.ac.kr

Abstract: With the advancement of smart construction technologies, researches are being conducted on technologies to monitor construction site conditions in real-time. Particularly, with the advancement of communication technologies, it has become possible to transmit and receive information quickly and accurately even in environments with difficult communication such as construction sites. These communication technologies are utilized for real-time management of construction site information and safety management based on worker location etc. Therefore, in this study, a system is aimed to be constructed a system that can monitor concrete strength using the maturity method and transmit it wirelessly to a strength monitoring system, targeting Korean construction sites. As a result of the case application, the concrete maturity temperature was measured using sensor, and it was confirmed that the temperature data was properly transmitted to the concrete estimating system through Bluetooth Low Energy(BLE) transmission. It is anticipated that this study will contribute to the activation of smart construction technologies at construction sites, automation of safety and quality management, and improvement in construction accuracy.

Key words: Wireless Concrete Strength Monitoring System, Maturity Method, Smart Construction Technology, Construction Management

ACKNOWLEDGEMENTS

This work was supported by the National Research Foundation of Korea(NRF) grant funded by the Korea government(MIST). (No. 2022R1A4A5028239)

REFERENCES

- [1] Kampli, G., Chickerur, S., & Chitawadagi, M. V. (2023). "Real-time in-situ strength monitoring of concrete using maturity method of strength prediction via IoT". *Materials Today: Proceedings*, 88, pp.110-118.
- [2] ASTM C1074-19, Standard Practice for Estimating Concrete Strength by the Maturity Method, American Society for Testing and Materials; ASTM International: West Conshohocken, PA, USA, 2021.