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Snow-Melting Technique for Concrete Pavements Using Shallow Geothermal Energy and Artificial Intelligence	Click on link to open report Work Plan ☐ Construction ☐ Evaluation ☐ Final ☒	8. Project No. 9. Project No. 10. Project No.

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14. Supplementary Notes

15. Abstract

Objective
The objective of this research was to evaluate the effectiveness of using geothermal energy to hydronically heat a concrete pavement. This heating method was to be tested under winter conditions and evaluated for performance, efficiency, and constructability in real-world transportation situations.

Scope
Two physical models were created with alternative reinforcement, piping layouts, and environmental conditions. These models were to be evaluated for temperature throughout the slabs, inlet and outlet temperature loss, energy consumption, and volumetric flow rate using sensor monitoring and software control. These models were to be installed in ambient conditions and evaluated through two winter seasons, and results reported on findings.

Summary
The test results of this research prove that the use of this geothermal energy has plenty of heat to melt snow from the surface of pavements. Although this technology is feasible, the time-to-melt and infrastructure/cost to setup and maintain a system such as this to maintain proper surface temperature is prohibitive to its implementation on large-scale transportation infrastructure. This system is also heavily dependent on the availability of hot-water aquifers that do not exist in all locations across the state and region.

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