

Introduction/ Background

- hot mix-asphalt pavements (HMA)
- concentration in HMA overlays.







9.5" PCC





overlays provide in reducing joint opening movement?

- all road sections.



Temperature Effect on Joint-Opening Movement within Composite Overlay Pavements By: Courtney Beavan

Yearly Variation Results



Ge

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- 1) Control, no HMA layer (Cell 983) - 2) 1.5 in. HMA (Cell 984)
- 3) 2.5 in. HMA (Cell 992)
- 4) 4 in. HMA (Cell 989)
- addition of an HMA overlay.

Pavement Interactive: <u>https://pavementinteractive.org</u> Van Deusen, D., Burnham, T., Dai, S., Geib, J., Hanson, C., Izevbekhai, B., ... Worel, B. (2018). Report on 2017 MnROAD Construction Activities. Minnesota Department of Transportation. http://www.dot.state.mn.us/research/reports/2018/201816.pdf

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Effect of Overlay Thickness on Joint-Opening



Percent Difference in Joint-Opening Compared to Control Section No Overlay 1.5 in. 4 in. 2.5 in.

- Average of peak-to-peak joint-opening movement compared to the control section.
- Joint-opening followed a similar cyclic pattern as temperature fluctuated.
- Magnitude of joint-opening movement was asphalt concrete overlay thickness dependent.
- In general, thicker overlays have less joint-opening movement.

Pavement Test-Sections

Summary and Conclusion

- Sudden temperature differences can greatly influence joint-movement.

- In cold weather joints contract and in warmer weather joints expand.
- Cell 983 (Control section with no HMA) had the greatest joint-opening movement
- The pavement joints reacted as expected based on asphalt thickness. In order from greatest variability to least variability:

- There was approximately a 30% reduction in joint-opening movement with the

Literature Cited

Acknowledgements