RESEARCH REPORT DOCUMENTATION PAGE

1. Report No.	2. Report Date	3. Contract No.	4. Project No.
ND 99-02	February 2003	N/A	IM-1-094(012)100

5. Title and Subtitle

Tining Versus Carpet Dragging For Texturing PCC Pavements

6. Report Type

Work Plan ☐
Construction ☐
Evaluation ☒
Final ☐

7. Project No.	8. Project No.	9. Project No.	10. Project No.
IM-5-094(018)059	IM-2-094(049)248	IM-2-094(043)289	IM-8-029(016)044

11. Author(s)/Principle Investigator(s)

Mike Marquart

12. Performing Organization Name and Address

NDDOT M+R ☒
NDDOT OTHER* ☐
NDSU ☐
UND ☐
UGPTI ☐
OTHER* ☐
*see supplementary notes

North Dakota DOT
Materials and Research Division
300 Airport Road
Bismarck ND 58504-6005

13. Sponsoring Agency Name and Address

North Dakota DOT
Materials and Research Division
300 Airport Road
Bismarck ND 58504-6005

14. Supplementary Notes

15. Abstract

Objective

The objective of this study is to determine if carpet dragging is a viable alternative to tining as a method for texturing Portland Cement Concrete Pavement surfaces. This study will concentrate on noise level (exterior and interior) changes, skid resistance, and an alternate method of determining texture characteristics.

Summary

The sand patch test was used to determine the texture depth in the carpet drag sections. The desire minimum average texture depth value as determined by ASTM E 965 is 0.80mm 0.032". The average sand patch depth for the tined sections was 0.092" or about 3/32" and for the carpet drag sections was 0.034" or about 1/32".

The roadside ambient noise study shows the decibel level to be 2.6 dB lower for light vehicles and 1.1 dB lower for heavy vehicles in the carpet drag sections as compared to the tining sections. This indicates that the carpet drag sections for light vehicles has nearly 1/3 the noise level as the tined sections. An increase of 10 dB is like doubling the noise level or sound loudness.

The present average skid number in the tined sections is 49.6 and 49.0 for the carpet drag sections. These skid numbers are well above the acceptable minimum value. The higher the number, the better the skid resistance.

The carpet dragging process must be watched very close in order to achieve and maintain the desired texture depth. Therefore the condition of the carpet must be monitored throughout the paving operation to insure that a uniformly roughened surface is achieved. The drag may have to be weighted down or the carpet cleaned in order to achieve the same texture as when the carpet was new. The carpet must be clean and free from mortar build-up to insure proper texture depth.

Project IM-2-094(049)248 was completed late in the fall of 2001. This project did not receive the carpet drag texture as planned. SP 289(97) changed the texturing process to reflect the Marquette Study, which has tining, skewed 1:6 left hand forward. Therefore, with no carpet drag texturing present on the project, no traffic, skid, and texture data was collected.

Averaging projects 1, 2, 4, and 5 in Table 6, shows that the turf drag sections are performing satisfactorily. The skid numbers are approximately equal and the noise loudness of the carpet section is about half of the tined section based on dB measurements.

Report is available upon request.

16. Key Words

Pavement Concrete
Construction
Finishing
Carpet Drag

17. Distribution Statement

No restrictions. This document is available to the public from:

North Dakota Department of Transportation
Materials and Research Division:
300 Airport Road
Bismarck ND 58504-6005
Office: (701) 323-6900

18. No. of Pages

28 report 100 appendix

19. File type/Size

Pdf / 1.0 MB / 4.3 MB-appendix