RESEARCH REPORT DOCUMENT PAGE

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Crushed PCC for Drainable Base Material

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

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*see supplementary notes

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13. Sponsoring Agency Name and Address

North Dakota DOT
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14. Supplementary Notes

15. Abstract

Purpose and Need

Past research has indicated that a drainable base located beneath pavement will increase pavement life. During reconstruction of PCC pavements, there is a need to recycle the existing material as not to deplete existing natural resources. The purpose of the project is to construct a PCC pavement with drainable base using virgin and recycled material in the drainable base. There was a need to determine if leachate from the recycled material will clog the edge drains and become ineffective.

Objective

The objective of this study was to compare the performance of crushed portland cement concrete (PCC) and virgin aggregate with a two-fractured face requirement for use as a drainable base material under PCC pavement.

Scope

The project is designed with the objective of comparing effectiveness of three drainable bases containing of 100% crushed PCC, 100% virgin aggregate, or a 50/50 blend of each. This study addressed the concern that the drainable bases using crushed PCC could have a clogging effect on the drainage system. Several states have experienced leachate on similar projects in the past. The study will evaluate and compare the distresses in the various sections and monitor the edge drains for accumulation of leachate. The evaluation will continue for a period of five years with evaluations annually.

The project is located on Interstate 29 in the northbound lane between reference points 175.1 to 183.15.

Summary

Longitudinal and transverse cracking was observed in all test sections. The amount of cracking is very minor in each section and there is not a sufficient amount of cracking in one section vs. another section to state that one permeable base reduces or increases the amount of cracking in PCC Pavement.

Materials and Research observed and evaluated several edge drainpipes located in the three different permeable base course sections. The six years of evaluation detected a material that is similar to a leachate or soil sediment. Some of this material is present in all three-test sections; however, volumes are not sufficient to prevent proper operation of the edge drain systems.

The edge drain systems continue to be in excellent condition, with the exception of grass clippings covering the head walls. The headwalls should be kept clean to prevent damming of draining water and material, which could result in flow restrictions in the edge drain system. Results obtained from experimental project ND 98-03, (*Vegetation Barriers Around Headwalls of Edge Drains*); indicate that the use of vegetation barriers can be effective in decreasing the accumulation of grass clippings thereby reducing headwall maintenance.

There appears to be no increase in leachate and/or pavement distresses when recycled PCC Pavement is used as a drainable base material.

Recommendation

It is recommended that 100 percent recycled pavement be used in the construction of permeable base.

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