CHARACTERIZATION OF UNBOUND MATERIALS (SOILS/AGGREGATES) FOR MECHANISTIC-EMPIRIACAL PAVEMENT DESIGN GUIDE (MEPDG)

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Key Points:

Project Number:
361-16-803
Start Date:
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Duration:
12 Months
Project Cost:
$147,935.68
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PROBLEM

The Mechanistic-Empirical Pavement Design Guide (MEPDG) conducts advanced mechanistic analysis of the pavement structure while taking into consideration the combined contributions of traffic, climate, and materials properties. The MEPDG is considered a leap forward from previous pavement design procedures, materials testing, and analysis. Review indicates resilient modulus (Mr) of unbound materials and soils have an impact on pavement performance.

OBJECTIVE

NDOT has a draft MEPDG that covers the various parts of the design process including an extensive database on the properties and performance of asphalt concrete mixtures. A proper estimation of the Mr value for locally available unbound materials used in base and subgrade layers becomes critical for designing long-lasting flexible and rigid pavements in Nevada. This research aims to edit the MEPDG to be customized to Nevada's unbound materials.

METHODOLOGY

An extensive and detailed research process will be done to complete the objectives of this research. These steps will be broken down into 7 tasks completed over the twelve-month timeline.

Task 1: Conduct Literature Review

Task 2: Analysis of various Techniques

Task 3: Identify Soil and Aggregate Materials

Task 4: Laboratory Testing

Task 5: Development of the Resilient Modulus Prediction Models

Task 6: Incorporate the Mr Correlations into the NDOT MEPDG Guide

Task 7: Reporting

IMPLEMENTATION POTENTIAL

This research has a strong probability of improving the sustainability of Nevada's roadway network using reliable and representative characterization of the existing unbound materials leading to better performing pavements.

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