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Correlation Between Friction Testing Devices in Utah

Because pavement friction is an important component to safe roads, UDOT personnel asked researchers at Brigham Young University and Raba Kistner Infrastructure to determine whether the frictional properties of aggregates used in asphalt surface treatments can be predicted and correlated to laboratory testing. Twelve pavement sections scheduled for resurfacing, ranging from 3 to 12 years old, were selected in Salt Lake, Sevier and Emery Counties consisting of Open Graded Surface Course (OGSC), Chip Seal and Stone Matrix Asphalt (SMA). Each site was then tested with five different surface friction measuring devices.

Friction testing devices at research site

Each pavement section was tested for frictional properties using the lock wheeled skid trailer, British Pendulum and Dynamic Friction Tester (DF-Tester). In addition, each pavement section was tested for pavement texture using the sand patch method and Circular Texture Meter (CT-Meter). During a twelve month period, each site was monitored three separate times. Samples of the aggregates used in the road surfaces were also obtained and tested in the laboratory.

The DF-Tester and CT-Meter had not previously been used in Utah before. Through a loan program set up through the FHWA, the two devices were sent to Utah on a two month loan. A researcher from Penn State was flown in to provide a full day workshop to train on how to run the devices. All together, the training and equipment received and fully funded through the FHWA loan program represent over a $100,000 value to UDOT.

DF-Tester underside, showing rubber slider pads

The data collection portion of the research recently concluded in June and the preliminary analysis is underway. The purpose of this research is to compare field friction measurements to laboratory friction measurements and evaluate how well the correlation between the two can predict the observed results. The researchers hope to be able to develop a three-way correlation of measurements between the British Pendulum Tester (BPT) in the field, the BPT in the laboratory, and the lock-wheel skid trailer.

Measuring the surface friction with a British Pendulum Tester

Previous research suggests that a correlation exists between the skid trailer and the laboratory accelerated polish test. By adding a Utah based testing program to supplement and extend their earlier work, the researchers hope to produce statistically significant field and lab correlations. Recommendations will then be made for the use of this information to establish friction guidelines. Appropriate use of this information by pavement managers can, in time, have a major impact on reducing accidents affected by low friction.

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