Statement No. 28

Arkansas Department of Transportation

Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 09/15/2017 | **PROJECT AREA:** Materials

TITLE: Non-nuclear Moisture Content Determination

PROBLEM STATEMENT:

The nuclear density gauge is the most commonly used device to rapidly determine the moisture content and unit weight of subgrade soils, base courses, and asphalt pavements. Use of the nuclear density device requires special permitting, special training, and may expose the user to additional amounts of radiation. Although trying to reduce the use of nuclear density devices has been of interest to the Arkansas Department of Transportation (ARDOT), previous research projects (MBTC 2075, TRC1301) that were performed found that while the currently available non-nuclear technologies (Humboldt Electrical Density Gauge and TransTech Soil Density Gauge, TransTech Pavement Quality Indicator, Troxler PaveTracker) were capable of accurately determining the density of the soil/asphalt, the devices were not able to accurately determine the moisture content of the soil. A non-nuclear method to accurately and rapidly determine the moisture content of soils and asphalts is needed.

OBJECTIVES:

The objective of this research project is to develop a non-nuclear method to rapidly and accurately determine soil moisture The use of cobalt chloride is proposed. Cobalt chloride quantitatively change color when subjected to moisture in soil samples. Cost savings will be realized through a reduction in expenses 1) associated with required yearly training/certification courses, 2) related to maintenance and calibration of existing devices and procurement of new nuclear devices

FORM OF RESEARCH IMPLEMENTATION:

This research will be implemented through the use of cobalt chloride instead of the nuclear density gauge. A users manual and demonstration on the use of the chemical for determination of moisture content will be provided.

Estimated Project Duration: 24 **months**

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Standing Subcommittee Ranking	Advisory Council Ranking	Statement Combined with Statement Number(s)
6 / 12	31 / 44	