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Project Overview Report

1. UTC Identifying Number

   DTRT13-G-UTC28

2. Center Identifying Number

   CAIT-UTC-NC35

3. Project Title

   Evaluating Electrical Resistivity as a Performance based Test for Utah Bridge Deck Concrete

4. Principal Investigator & Contact Information

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5. Rutgers/CAIT Project Manager

   Patrick Szary, Ph.D.

6. Customer Principal

   Bryan Lee
   Materials Engineer
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7. Project Description

   Concrete surface resistivity (AASHTO Spec) and bulk resistivity, are easy to implement, non-destructive tests which can identify several important parameters, including concrete permeability and can potentially be correlated to applied tension loads, pore size distribution, alkali silica reaction, sulfate attack, internal relative humidity accurately detect setting time. This project seeks to synthesize national literature and past projects, focusing on performance metrics. Concrete mixtures and specimens from around the state of Utah, will be investigated to identify relevant phenomena using several variations of concrete constituents, including multiple aggregate types, common supplementary cementitious materials, w/c ratios and curing styles. All mixtures will be mixed by ready mix companies and precasters within the state of Utah. Mechanical and durability properties will be investigated, including (but not limited to) strength, elastic modulus, chloride ion permeability, freeze thaw, surface resistivity and bulk resistivity. Relationships between measured variables will be identifiified and variability associated with the resistnace measurement techniques. This project will seek to estimate acceptable levels of performance metrics (i.e., concrete permeability) including the synthesized literature and past UDOT projects quantifying bride deck performance metrics.

8. Implementation of Research Outcomes (or why not implemented)

   This research will be implemented shortly after completion through a performance based specification for bridge deck concretes in Utah. This specification will be assembled and agreed upon by local industry (ready mix and precasters), UDOT engineers and the research team. Furthermore, through a partnership with LTAP, this performance based specification can be presented as a template for local municipalities and counties for their use as well.

9. Impacts/Benefits of Implementation (actual, not anticipated)

   TBD

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10. Dates and Budget

    Start Date: 4/1/2016
    End Date: 12/31/2017
    UTC (CAIT) Dollars: $ 52,786
    Cost Sharing: $ 75,984
    Total Dollars: $ 128,770

11. Keywords

    bridge decks, concrete resistivity, non-destructive evaluation

12. Web Links (Reports and Project Website)

    http://cait.rutgers.edu/cait/research/evaluating-electrical-resistivity-performance-based-test-utah-bridge-deck-concrete