RESEARCH
PROJECT CAPSULE [20-1GT]
November 2019
TECHNOLOGY TRANSFER PROGRAM

Literature Search on Use of Plastic Pipes in Highway Engineering for DOTD's Needs

JUST THE FACTS:

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9 months

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POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used / Implementation Potential

PROBLEM

Drainage is a critical consideration in Louisiana highway projects. A long-term record of use and performance of rigid concrete pipe for drainage is available at the Louisiana Department of Transportation and Development (DOTD), but this is not the case for plastic pipe.

Plastic pipe includes various polymer-based materials, e.g., high-density polyethylene (HDPE), polyvinyl chloride (PVC), and polypropylene (PP). A better understanding of the applications, limitations, and advantages of plastic pipe is desired.

OBJECTIVE

The primary objective is to determine where, when, and how DOTD can use plastic pipe for drainage. A long-term goal is to document the use and performance of plastic pipe in Louisiana and surrounding states with similar soil conditions to develop recommendations for important parameters to consider when selecting plastic pipe, to recommend installation procedures, and to determine the best scenarios for use.

METHODOLOGY

A history of DOTD specifications for culverts and storm drains will be compiled in chronological order to provide a baseline of prior recommendations and document the important criteria. Current literature regarding plastic pipe and its application to highway drainage systems will be summarized.

The practices of neighboring states will be investigated, beginning with an online search of available documents, with potential for site visits and communications with their design and materials engineers.

Because concrete pipe represents the most commonly used alternative to plastic pipe, it will be used as a baseline for comparison. Factors under consideration include pipe dimensions, structural capacity and loading criteria, cost, service life, and maintenance.

IMPLEMENTATION POTENTIAL

A comprehensive table will be prepared for DOTD engineers to visualize advantages and limitations for various types of plastic pipe.