HPP PROJECT DESCRIPTION

PROJECT NUMBER
02216

PROJECT TITLE
AASHTO 2001 Design of Cantilevered Sign Supports

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PROJECT OBJECTIVE:
The main objective of this study is to evaluate the safety and economy of cantilevered overhead sign supports in the state of Alabama that are designed in accordance with the new wind load and fatigue provisions published earlier this year by AASHTO. Another objective of the study is to transfer the knowledge gained from this research to the engineers and designers of Alabama DOT through a half-day workshop.

PROJECT ABSTRACT:
AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals has been revised in its entirety through a major research project conducted under the auspices of the National Cooperative Highway Research Program (NCHRP 17-10). The new document was published by AASHTO in 2001. A major part of the revisions includes updated provisions and criteria for extreme wind loads and new provisions and criteria on fatigue design. These provisions differ considerably from those in previous editions of the specifications. The impact of the revised wind load provisions and new fatigue design criteria on the design of cantilevered overhead sign structures from the standpoint of safety and economy has not been studied and is the main goal of this proposed work. A secondary objective of project is to disseminate the information gained from this research to the engineers and designers of Alabama DOT.
PROJECT TASK DESCRIPTIONS:
Task 1 - Determine impact of new wind provisions on design of cantilevered overhead sign supports.
Task 2 - Determine impact of the new fatigue criteria on the design of cantilevered overhead sign supports
Task 3 - Prepare report summarizing Tasks 1 and 2.
Task 4 - Organize a workshop to present the results of the study to Alabama DOT engineers and designers.

MILESTONES AND DATES:
Task 1: Jan. 1 to Apr. 30
Task 2: May 1 to Sept. 30
Task 3: Oct. 1 to Dec. 31
Task 4: Dec. 1 to Dec. 31

TOTAL BUDGET:
One-year project: other (HHP) $39,787; total budget $79,524.

STUDENT INVOLVEMENT:
A graduate student will be identified to work on the project as part of his master’s research.

RELATIONSHIP TO OTHER RESEARCH PROJECTS:
UTCA Project #00218 studied the effects of new wind loading criteria and wind map on the design of structural supports. This project will expand on UTCA’s Project #00218 and produce a final document that will explain the overall combined effect of the new wind and fatigue design provisions in the 2001 Supports Specifications.

TECHNOLOGY TRANSFER ACTIVITIES:
As part of this research study, a four-hour workshop will be planned after completion of the work to present to ALDOT the results of the study and the impact of the revised wind provisions and new fatigue criteria on the design of cantilevered overhead sign structures in Alabama.

POTENTIAL BENEFITS OF THE PROJECT:
The new wind and fatigue provisions of AASHTO 2001 have not been used or evaluated by most state departments of transportation, and as such no information is available on the design of structural supports using this national specification. Both design criteria will have a direct bearing on the safety and economy of sign supports. As indicated earlier, the wind loads on support structures could increase or decrease drastically depending on the location of the structure in the state, hence resulting in significant increase in member sizes. The fatigue criteria may also result in significantly heavier and more costly designs. This work will establish ALDOT as a lead DOT in the U.S. regarding knowledge of AASHTO 2001 and the impact of the new wind provisions and fatigue criteria on the design of structural supports.
TRB KEYWORDS:
extreme wind loads, fatigue loads, highway signs, cantilevered overhead sign structures, structural supports