PROJECT NUMBER
05315

PROJECT TITLE
Multimedia Resource for LRFD Steel Bridge Design

PRINCIPAL INVESTIGATOR:
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PROJECT OBJECTIVE:
The goal of this project is to develop a multimedia package for interpreting and implementing the new AASHTO Load and Resistance Factor Design Specifications (LRFD Specifications). This will be achieved by designing a comprehensive, self-training tool in the form of a CD-ROM or/and a website. The CD-ROM will be highly machine adaptable and designed to run on different operating systems including Windows XP. This will allow the broad use of the multimedia package. In short, the proposed effort embodies a major step towards designing bridges in Alabama from 2007 onwards.

PROJECT ABSTRACT:
In 1994, the American Association of State Highway and Transportation (AASHTO) officials launched the first edition of the LRFD Bridge Specifications to replace the standard bridge specifications that could not keep up with emerging technologies. The primary objective of the new code was to ensure a more uniform level of safety than provided by the previous AASHTO Standard Specification of Highway Bridges... The AASHTO LRFD is based on new developments in engineering, sound principles, and logical approaches to ensure constructability, safety, serviceability, inspectability, economy, and aesthetics. LRFD incorporates the best of working stress design and load factor design familiar to practicing bridge engineers. It is a comprehensive, well-organized, and practical specification, with commentary to provide explanation and background information. Bridges designed according to LRFD have the inherent advantage of a more uniform level of safety, resulting in low life-cycle cost. LRFD allows the use of advanced methods in design and analysis, and provides flexibility for maintaining good and successful engineering practices or customizing load and resistance factors to meet the demand of a project.

PROJECT TASK DESCRIPTIONS
1. Evaluate AASHTO Bridge Design Specification and reliability concepts.
2. Learn about changes to load and resistance models and compare LSD and LRFD designs.
3. Develop the multimedia resource materials for the AASHTO Load and Resistance Factor Design Specifications using the 3rd Edition of the code.
4. Develop comprehensive LRFD steel bridge design examples for the multimedia resource material.
5. Perform limited tests of the final version of the instruction tool with a group of ALDOT engineers.
6. Refine the initial version and release refined modules for testing.
7. Survey senior ALDOT engineers, adjust the refined version and release the final version.
8. Develop a final report.

MILESTONES AND DATES
Task 1: Jun-Jul, 2005
Task 2: Aug-Sep
Tasks 3-4: Oct ‘05 – Feb ‘06
Task 5: Mar-Apr
Task 6: May
Task 7: Jun
Task 8: Jul ‘05

TOTAL BUDGET:
14 month project: $50,000 cash and $50,367 (matching); total budget $100,367.

STUDENT INVOLVEMENT:
One full time student and one undergraduate student will be work on this project.

RELATIONSHIP TO OTHER RESEARCH PROJECTS:
UTCA projects 02303 - “Structural Damage Resource Materials,” 03301 – “Multimedia Technology for Timber Bridge Repair,” and 04312 – “Multimedia Technology for Bridge Repair: Final Phase” are related to this project. Some the approaches used in these projects will be used in this research project.

TECHNOLOGY TRANSFER ACTIVITIES:
This project primarily focuses on technology transfer. It will provide design engineers with excellent methodology and clear and concise sources of information on how to use the new code for bridge designs of year 2007 onwards. This technology will provide a simple yet highly effective tool for training staff members at ALDOT engineers.

POTENTIAL BENEFITS OF THE PROJECT:
The CD-ROM or/and website will ensure streamlining of ALDOT’s training procedures in interpreting and implementing the new AASHTO Load and Resistance Factor Design Specifications. More specifically, it will provide ALDOT engineers with the knowledge on how to use this new code for bridge designs of year 2007 onwards.

TRB KEYWORDS
Design, LRFD, strengthening, retrofit, replacement, bridges, multimedia