



Project Summary

Texas Department of Transportation

0-5884: Handling Issues for Lead and Asbestos in Bridge Construction

Background

At present, there are approximately 50,000 bridges in the state of Texas, according to TxDOT officials. Each of these bridges, whether steel, concrete, timber, or some combination thereof, has the potential for containing hazardous materials such as lead-based paint (LBP) and asbestos-containing material (ACM). LBP was used for years in steel bridge structures to protect against corrosion of the metal due to exposure to the elements and anti-icing chemicals. LBP, which was once thought to be the perfect material, now must be removed when repainting or repairs are needed. ACM, though typically found in smaller amounts than LBP, is used in several types of bridge structure. ACM is used in the coatings on some concrete or timber bridges, mastics and sealants, and in some cases is used as a coating on steel structures.

In order to ensure worker safety and comply with federal regulations, TxDOT desired to develop a set of policies and procedures that will allow TxDOT to deal with lead and asbestos handling issues in an economic manner with limited liability exposure in bridge construction and repair.

What the Researchers Did

To assist TxDOT in developing policies and procedures for handling bridge material containing lead and asbestos, two approaches were used. Other states in the U.S. were surveyed to assess how they handled lead and asbestos issues. Various departments of transportation (DOTs) and environmental offices were contacted to determine the best procedures for the handling and disposing of ACM and LBP construction materials as well as monitoring worker safety.

In addition to the phone survey, state and federal laws were reviewed to provide a concise summary of the main issues of concern to TxDOT, as identified by the project supervisor and supervisory committee. The Lead FAQs and Asbestos FAQs developed from this portion of the research may be provided to TxDOT personnel, contractors, and other individuals interested in lead and asbestos issues.

What They Found

Throughout this project, several common practices were found to be in place nationwide. Some of these practices include contractual requirements for contractors to comply with all applicable regulations and the outright handing over of, and thereby responsibility for, excess materials to contractors. Most of these practices were included as recommendations for TxDOT to implement immediately so as to reduce costs and future liability.

Research Performed by:

Center for Multidisciplinary Research in Transportation (TechMRT),
Texas Tech University

Research Supervisor:

Audra Morse, TechMRT

Researchers:

Charles Newhouse, TechMRT

Jed Taylor, TechMRT

Project Completed: 2-29-08

Other states had suggestions regarding the disposal of ACM and LBP. One of these practices was to encase ACM in concrete and then dispose of it in a landfill. A disposal method for LBP is to smelt steel members, the most common form of steel recycling, with any lead-based coatings still in place. This approach, already in practice by TxDOT, allows the LBP to be removed during the smelting process where it becomes a by-product of the smelting process. As a by-product, it becomes the responsibility of the smelter/recycler, not TxDOT. Additionally, smelting LBP in place supports the transfer of ownership of materials to other entities; as such, the responsibility for the material is also transferred.

Another recommendation from the study is to conduct a study of all bridges in Texas to determine the actual location, quantity, and nature of both LBP and ACM. Through the course of the phone survey, it was determined that some states have actively located and removed both LBP and ACM. This ensures these substances will not be of concern in the event of later bridge projects. This has also resulted in a complete absence of LBP, ACM, or both, on bridges in those states. Ultimately, early identification of ACM and LBP would help TxDOT during project planning stages and allow it to set up contracts to abate LBP or ACM in advance, thus preventing future delays or additional incurred costs.

One of the simplest ways of reducing TxDOT liability is to simply have some form of oversight of contractor controls and safety protocols used to protect employees from LBP and ACM exposure. The recommended form of this oversight is to have the contractors submit in writing a copy of all safety practices, engineering controls, and other protocols employed to protect their workers on a project, with particular guidelines dealing with LBP and ACM.

Another way to protect worker safety is to use ambient air monitors to determine exact airborne lead levels. This finding was backed up during the phone survey when it was determined that several states either use their own ambient air monitors or allow contractors to use ambient air monitors to determine airborne lead levels. Air monitoring would allow for risk assessment exposure during short projects and may minimize the number of biological samples needed to assess worker exposure to lead.

What This Means

The combined results from the phone survey and literature review have been used to form more than a dozen recommendations for immediate use and future research. The recommendations, if implemented, are intended to reduce TxDOT's liabilities and costs, while protecting workers exposed to ACM and LBP during bridge construction, maintenance and demolition. Additionally, the FAQs developed during the project provide a concise resource answering many commonly asked questions regarding compliance with lead and asbestos regulations.

For More Information:

Research Engineer - German Claros, TxDOT, 512-465-7403
Project Director - Brian Merrill, TxDOT, 512-416-2232
Research Supervisor - Audra Morse, TechMRT, 806-742-3485

Technical reports when published are available at:
<http://library.ctr.utexas.edu/index.html>

www.txdot.gov
keyword: research



Research and Technology
Implementation Office
P.O. Box 5080
Austin, Texas 78763-5080
512-465-7403

This research was performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration. The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation, nor is it intended for construction, bidding, or permit purposes. Trade names were used solely for information and not for product endorsement.