



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

May 27, 2009

CIRCULAR LETTER 2009-10

BRIDGES WITH TIMBER SUBSTRUCTURES

COUNTY ENGINEERS/SUPERINTENDENTS OF HIGHWAYS
MUNICIPAL ENGINEERS/DIRECTORS OF PUBLIC WORKS
CONSULTING ENGINEERS

On August 19, 2008 a township structure in DeKalb County collapsed. Pursuant to this bridge collapse, a team of individuals from the Illinois Center for Transportation (ICT), the Illinois Department of Transportation, and the Federal Highway Administration performed a forensic investigation to research the probable causes of structural failure. The final report, prepared by ICT, is located at <http://ict.illinois.edu/Publications/report%20files/FHWA-ICT-09-042.pdf>. Based on the findings of this study, the department is providing guidance for structures having timber substructures.

The report indicates timber substructures are vulnerable to the eccentric loads caused by traffic as it crosses a span, particularly those produced by trucks and other heavy loads. Therefore, the department recommends against issuing permits for overload vehicles to cross over bridges with timber substructures without first performing an in-depth inspection and analysis. Simply supported structures are particularly susceptible to eccentric loadings. Additionally, structures with heavy superstructures, such as precast concrete deck beams, or tall substructure units are at greater risk of failure due to eccentric loads. Based on the experimental and analytical work conducted, the effects of eccentrically applied loads should be considered when performing overload and load rating analyses.

The number and structural integrity of bridges founded on timber substructures is concerning for the department and all bridge owners. Many of these structures are coming of age and now require, or soon will require, rehabilitation. Several of the current methods used to repair timber piles provide little or no moment resistance, making these structures even more prone to problems related to eccentric loading. The department has initiated a research study to develop improved details for repairing damaged or deteriorated timber piles. The results of this study will be disseminated upon completion.

CIRCULAR LETTER 2009-10

Page Two

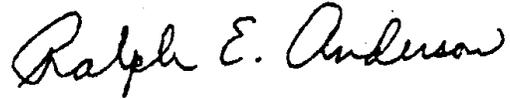
May 27, 2009

If you have any questions regarding this Circular Letter, please contact Jack Elston at (217) 785-8748 or jack.elston@illinois.gov.

Sincerely,



Darrell W. Lewis, P.E.
Acting Engineer of Local Roads and Streets



Ralph E. Anderson, P.E., S.E.
Engineer of Bridges and Structures

cc: Dan Brydl, FHWA - Illinois Division
Gary Iles, Illinois Department of Natural Resources
Elias Ajami, Illinois State Toll Highway Authority
Bryan Smith, Township Officials of Illinois
Les Hild, Township Highway Commissioners of Illinois (Mt. Pulaski, Logan County)