CONDITION ASSESSMENT OF AUGUST A. BUSCH BRIDGE DECK USING PORTABLE SEISMIC PROPERTY ANALYZER AND GROUND PENETRATING RADAR

Samie Hamad, Missouri University of Science and Technology, Rolla, MO, USA
Salah Shaniba, Mellitah Oil & Gas B.V, Tripoli, LIBYA
Wajdi Ammar, University of Colorado, Denver, CO, USA

Non-destructive testing tools, such as ground penetrating radar (GPR) and the portable seismic property analyzer (PSPA), extensively used in the past two decades for monitoring, quantifying, and mapping the deterioration of bridge decks. Using PSPA and GPR ensures regular monitoring of bridge conditions, leads to the early detection of deterioration, and plays a major role in bridge serviceability. This is important, as not knowing the integrity of bridge decks increases maintenance costs and presents public safety hazards.

The goal of this paper were to address the condition of August A. Busch bridge deck owned by the Missouri Department of Conservation (MDC), also generated plan-view maps, showing the thickness of the bridge deck and details of the pattern, placement, and density of the deck's reinforcement steel bars. This is significant because the MDC no longer has design details or as-built drawings. This research also assessed the capability and compatibility of the three different assessment approaches (visual inspection, PSPA, and GPR) when used together. If this technology proves to be cost-effective, the MDC can acquire these data for each of Missouri's bridge decks.

Visual inspection, GPR, and PSPA data were acquired on the bridge deck located at August A. Busch Conservation Area. Over 90% of the August A. Busch Bridge's deck was in good condition with an average compressive strength of over 2500 psi. Ground penetrating radar data showed no indication of significant deterioration. the overall bridge deck was determined to be in fair to good condition, and it was recommended that the August A. Busch Bridge deck be inspected every 24 months.