

THE INFLUENCE OF TEMPERATURE AND MOISTURE CHANGE ON GROUND PENETRATION RADAR SIGNAL USED FOR BRIDGE DECK ASSESSMENTS

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Non-Destructive Techniques (NDT) are widely used to determine the condition of reinforced concrete in bridge decks. This study demonstrates the potential relationship between the GPR tool and the weather change (temperature and moisture content). The Ground Penetrating Radar can be influenced by significant variations of temperature and moisture content, which may affect its capability on detecting reinforcing rebars. The case study is conducted on a pedestrian reinforced concrete bridge deck at Missouri University of Science and Technology.

NDT provide significant and non-invasive way of evaluating bridge deck condition which help on assessing the concrete conditions in terms of the level of degradation. The accurate assessment of concrete quality is determined by the variations of reflected amplitude signal and dielectric permittivity of concrete that can be varied by temperature and precipitation measurements. The initial results indicated that GPR is a significant geophysical tool to image the reinforcing steel (rebars) embedded in the concrete bridge deck. However, significant changes in weather conditions have an obvious impact on the interpretation of GPR data used for the concrete assessment.