

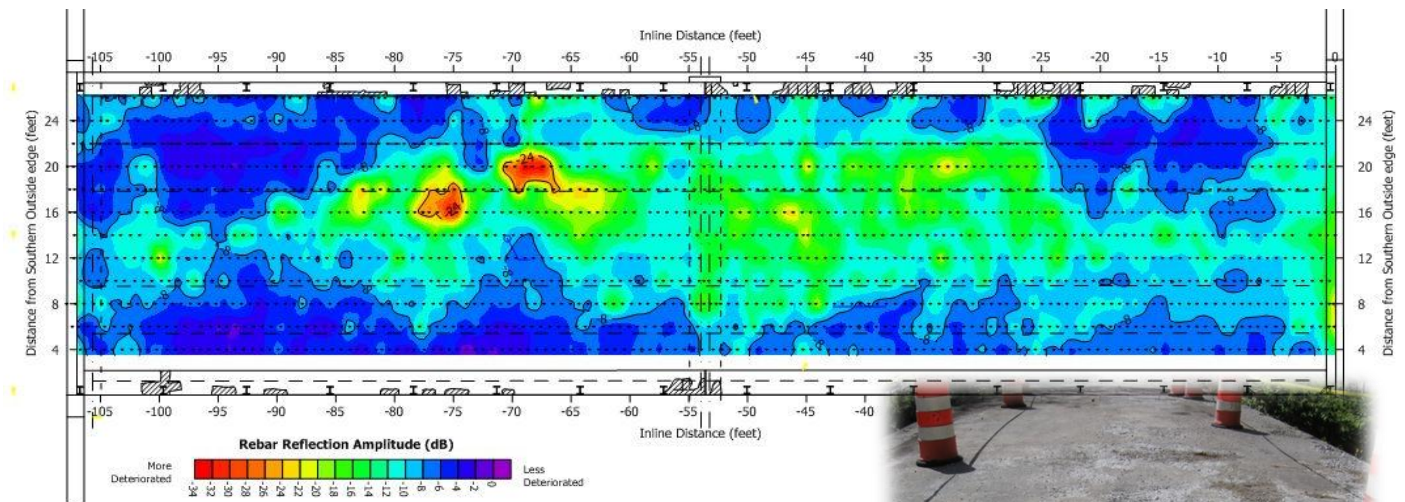
# Quality Geophysics

## Geophysical Application – Ground Penetrating Radar

### Asphalt Covered Bridge Deck Assessment

Assessing the condition of a bridge deck when an asphalt overlay is present can be a challenging endeavor with uncertain results. In an ideal world, the ability to peer thru the asphalt and into the concrete would provide an ideal solution. Fortunately, in today's world with judicious use of ground penetrating radar (GPR) this ideal is becoming a reality.

By using either a ground contact or air-launched high-frequency antenna a GPR survey can be performed. Using a systematic approach, the entire bridge deck can be evaluated for deterioration. Geophysicists pay close attention to rebar reflections within the bridge deck. The concrete-rebar will have a consistent and predictable reflection coefficient in areas where the rebar remains intact. However in areas where corrosion is beginning to effect the rebar, the reflection coefficient will change. By creating a map of rebar reflection coefficients, a geophysicist can map rebar integrity across a bridge.



Initial mapping is often performed as decibel down from the greatest reflection coefficient measured. Using the GPR survey map as a guide, concrete core samples can be collected for conventional assessment and laboratory testing. It has been found that correlation of reflection coefficients to chloride content permit a quantification of deterioration in a more conventional fashion.

