

Infrasense, Inc. Maps the Condition of 36 Bridge Decks in Wyoming using Ground Penetrating Radar, Infrared Thermography, and Visual Surveys

Infrasense, Inc. has completed nondestructive condition evaluations of 36 bridge decks along interstate 80 between Arlington and Pine Bluffs, Wyoming. A combination of ground penetrating radar (GPR), infrared thermography (IR), high resolution video, and visual underside surveys were carried out to provide a comprehensive assessment of each deck, results included quantities and maps of deterioration, patching, spalling, and cracking.

Wyoming ([PRWEB](#)) December 21, 2015 -- Infrasense, Inc., a national leader in infrastructure nondestructive evaluations, has recently completed GPR, infrared and high resolution visual surveys of 36 bridge decks along interstate 80 just west of Cheyenne, Wyoming. The surveys were carried out at driving speed, so no lane closures were required and the traveling public was not interrupted. Condition data was collected for all 36 decks in just 5 days, which is significantly more efficient than using traditional inspection methods such as sounding. The field efforts, particularly the underside inspections, were supported by University of Wyoming staff and students.

Following data collection, the NDE data was analyzed to quantify and map subsurface conditions using in-house software and proprietary methodologies. Quantities and maps of delamination/ deterioration, patching, spalling, and cracking allow bridge engineers and managers to both prioritize future repair, rehab, and replacement efforts, as well as scope out the extent of repair for contracts being put out to bid.

Ground penetrating radar (GPR) data is collected at highway speeds, making it the fastest NDE technology for estimating rebar depth, corrosion conditions, and deteriorated concrete. The GPR data is collected in a series of lines spaced 3 feet transversely across the width of the deck, with each line representing a cross sectional slice of the deck at a particular offset. Decks in good condition consist of strong and uniform radar reflections from the top mat of rebar and bottom of the deck. GPR data with weak and inconsistent reflections is indicative of concrete deterioration.

Infrared thermography (IR) data is collected in a series of passes across each deck, with each pass covering a deck width of between 12 and 15 feet. Surveys are performed at normal driving speeds to prevent lane closures and traffic disruptions. During the survey, regular visual data is collected synchronously with the infrared data, so that surface features such as staining, patching, and spalling can be mapped and differentiated from thermal anomalies associated with subsurface delamination.

Underside condition mapping is carried out in the field using a high resolution digital camera and plan-view drawings. The field inspection crew visually inspects all accessible portions of the bridge deck underside. Areas of distress including spalling, evidence of moisture infiltration, efflorescence, and cracking are mapped on the plan-view drawing and assigned a quantity based on the estimated dimensions. A comprehensive series of photographs are captured, with the location and direction of each photo recorded on the plan-view drawing. The field drawings, quantity estimates, and photographs are later used to create scaled underside condition maps.

Ground penetrating radar, infrared, and visual image datasets provide transportation agencies with accurate and comprehensive bridge deck condition information, enabling effective preservation, rehabilitation, and replacement decisions. With large bridge deck inventories, highway agencies have primarily relied on visual inspection. Since the mechanisms of deterioration occur below the surface, subsurface investigation is most



effective to evaluate the estimated lifetime of these bridges.

About Infrasense, Inc.

Since 1987, Infrasense, Inc. has applied state-of-the-art technologies to address the most difficult challenges in subsurface scanning. Infrasense's engineers are able to nondestructively extract critical information from a diverse range of structures. In addition to providing ongoing subsurface evaluation services to clients across the country, the firm has also conducted numerous research programs to advance the field of subsurface detection and non-destructive evaluation.



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