

Guided Wave Inspection of Rail Level Crossings

Case Study 17



Level Crossings

Level crossings allow road traffic to cross railway lines at track level by means of a set of removable roadway or deck panels installed between the rails. The deck panels fit tightly between the rails with the minimum gap required to allow the passage of trains, which means the rail within the crossing is not fully visible. Additionally, the deck panels tend to trap moisture and road-salt causing accelerated corrosion of the lower sections of the rail, especially the toe. Level crossing rails are therefore high risk areas due to the combination of the limited effectiveness of current inspection methods and high corrosion rates which often exist.

Currently detection of defects at the toe is only possible using visual inspection. These inspections require the entire deck to be removed, making them very invasive and expensive processes given that in most cases the visual inspection shows the rail to have no defects. Occasionally, the corrosion reaches such an advanced state that the rail breaks before the defects are detected.

G-Scan GWT

Guided Wave Testing (GWT) using G-Scan offers a solution to the problem as it is capable of testing the rail section through the level crossing in a cost-effective way without lifting the roadway or disturbing the road or rail traffic movements.

The equipment utilizes an array of piezoelectric transducers, dry coupled to the rail surface. Guided waves can travel up to 30m along the rail in both directions from the transducer array, allowing defects within the diagnostic range of the test to be detected, located and prioritised.

Equipment



Wavemaker® G4

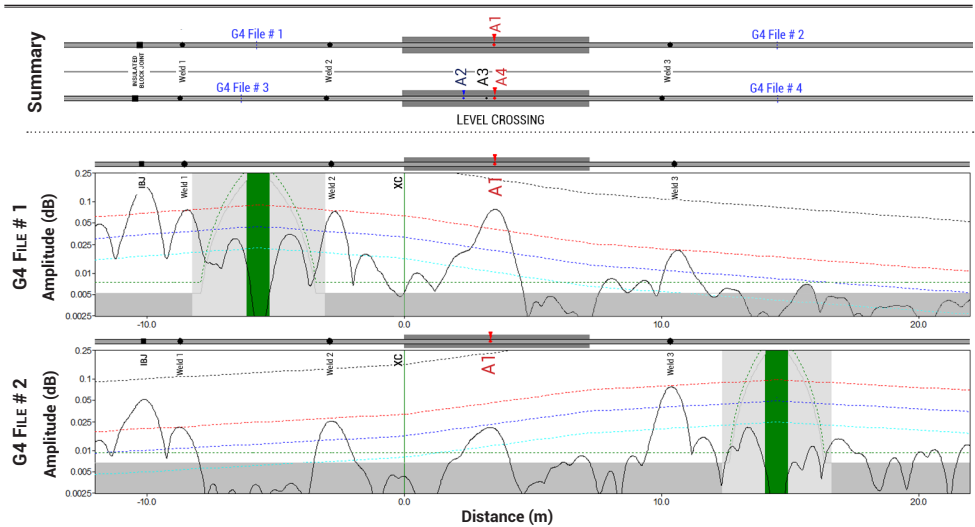


G-Scan

Rail Level Crossings

Guided Wave Testing applied to Rail Integrity

WavePro™ - GWT Results



Proven Results

A summary of the tests carried out on both rails of a level crossing is shown above. The locations of the detected defects are marked, indicating their severity by their colour (red - Severe, blue - Medium and black - Minor). Test results from one of the rails are shown below the summary, displaying the detection of a severe indication close to the middle of the crossing.

Once the roadway was removed the defects shown below confirmed the findings given by the G-Scan inspections.



Defect found at location of GWT Indication A1.



Defects found at locations of GWT Indications A3 & A4.

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