

Sandbox Experiment of Subsoil Corrosion Detection using Geoelectrical Methods

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Abstract

After a building poses a risk for corrosive activities, it is necessary to investigate the danger and need for the detection of subsoil corrosion. A geoelectrical method, particularly electrical resistivity, is a measurement of the soil's corrosivity. When water leaks out of the spaces between soil particles, the soil's resistivity rises, and when the soil is corrosive, it sharply falls. The Electrical Resistivity Imaging (ERI) demonstrates that the soil anion that caused the low resistivity that started the sandbox experiment has exchanged due to steel pile corrosion. The inversion model's 2D ERI data clearly shows the zone of subsoil corrosion that developed during the experiments. The zone affected by the anomaly of corrosion in the small zone surrounding the steel pile was visible in the 3D ERI results. The geochemical tests from ion-chromatography and monitoring data throughout the experiment confirmed the zone of different resistivity was due to soil corrosion.

Keywords: Electrical resistivity; Sandbox experiment; Soil corrosion; Electrical resistivity imaging; Geoelectrical method

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