

## Imaging of the internal geophysical structure by means of near surface geophysical surveys at a road embankment failure site.

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A road embankment which is about 8 m high was partly collapsed by a heavy rainfall. This embankment had been experienced a strong shaking two months before the collapsing caused by the 2016 Kumamoto earthquake. Surface cracks and deformation were identified on the body just after the earthquake. We conducted near surface geophysical survey to clarify a collapse process and internal geophysical structure of survived part of the road body. Our survey consisted of GPR and DC resistivity tomography. We used Utility scan DF system synchronized with GNSS antenna for a GPR survey. This system can obtain high accuracy positioning data within +/- 1 cm under RTK-FIX condition. In DC resistivity survey, current and potential electrodes were set alternately at 50 cm intervals along a line which cross at a collapsed part. As a result, GPR profile imaged a dipping structure behind the collapsed part. Resistivity structure showed relatively high resistivity as the embankment and imaged frontal thrust clearly. A possible sliding surface was interpreted on the basis of resistivity structure and surface displacement trajectory between before and after collapse of 5 points. In conclusion, GPR and DC resistivity tomography was helpful to delineate internal deformation structure and interpret a possible sliding surface. The survey result demonstrated the effectivity of detailed near surface geophysical surveys.

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