

## Near surface geophysical survey of Tamugiyama district, one of the devastated sites by 2004 Mid-Niigata Prefecture Earthquake

# Tomio Inazaki[1]; Yoshinori MIYACHI[2]

[1] PWRI; [2] IGG, AIST

Combined geophysical surveying was carried out in Tamugiyama district, Kawaguchi Town, one of the most devastated sites by 2004 Mid-Niigata Prefecture Earthquake. It was noticed that housing damage in the district showed characteristic difference even in such small district, and it was inferred to be attributed to the local site effect. Ongoing surface geological survey and near surface probing including drilling at 3 sites and sounding at 11 points have revealed the existence of a buried channel covered with fan deposits (Komatsu-bara, et al., 2006; Miyachi, et al., 2006). However, the detailed structure of the near surface was still unknown.

The geophysical surveys consisted of the following two methods; high-resolution seismic reflection using S-wave type Land Streamer, and capacitively coupled resistivity measurement using OhmMapper. The Land Streamer consists of a pair of woven belts, a seismic cable, and geophone units. The tool is featured as the non-stretch woven belts on which geophone units are mounted to form a multi-channel geophone array similar to a marine streamer. The tool can be easily towed by hand, or by a vehicle. The geophone units are coupled to the paved surface with the metallic baseplate. Even this non-planted coupling through the baseplate, the tool can acquire comparatively clean data on the pavement. The OhmMapper makes the transmitter and receiver to capacitively couple to the ground without planting galvanic electrodes, and consequently ensures high speed of field measurements.

Three survey lines (S1, S2, R3) were set in north-south direction in the district. Reconstructed resistivity profiles along the lines clearly delineated a high resistivity body surface of which was dipping gently southward at northern part of the district. A relatively low resistivity zone extended at the south side of the district. CMP seismic sections profiled a depression along with reflectors dipping southward. As a result, near surface structure of the Tamugiyama district was interpreted as follows; a surface of basement sediments was buried at shallow depths in the northern part of the district, and a channel like depression filled with thick loose deposits was embedded in the middle part of the district.