Geological Surveys Based on AEM

AEM 에 의한 지질조사

Airborne Electro-Magnetics Surveys

AEM (Airborne Electro-Magnetics) survey allows measuring electronic conditions of the ground to maximum depth of 150m by applying an electromagnetic induction generated when magnetic field which is produced artificially by using a helicopter from the air is penetrating into the ground.

Features

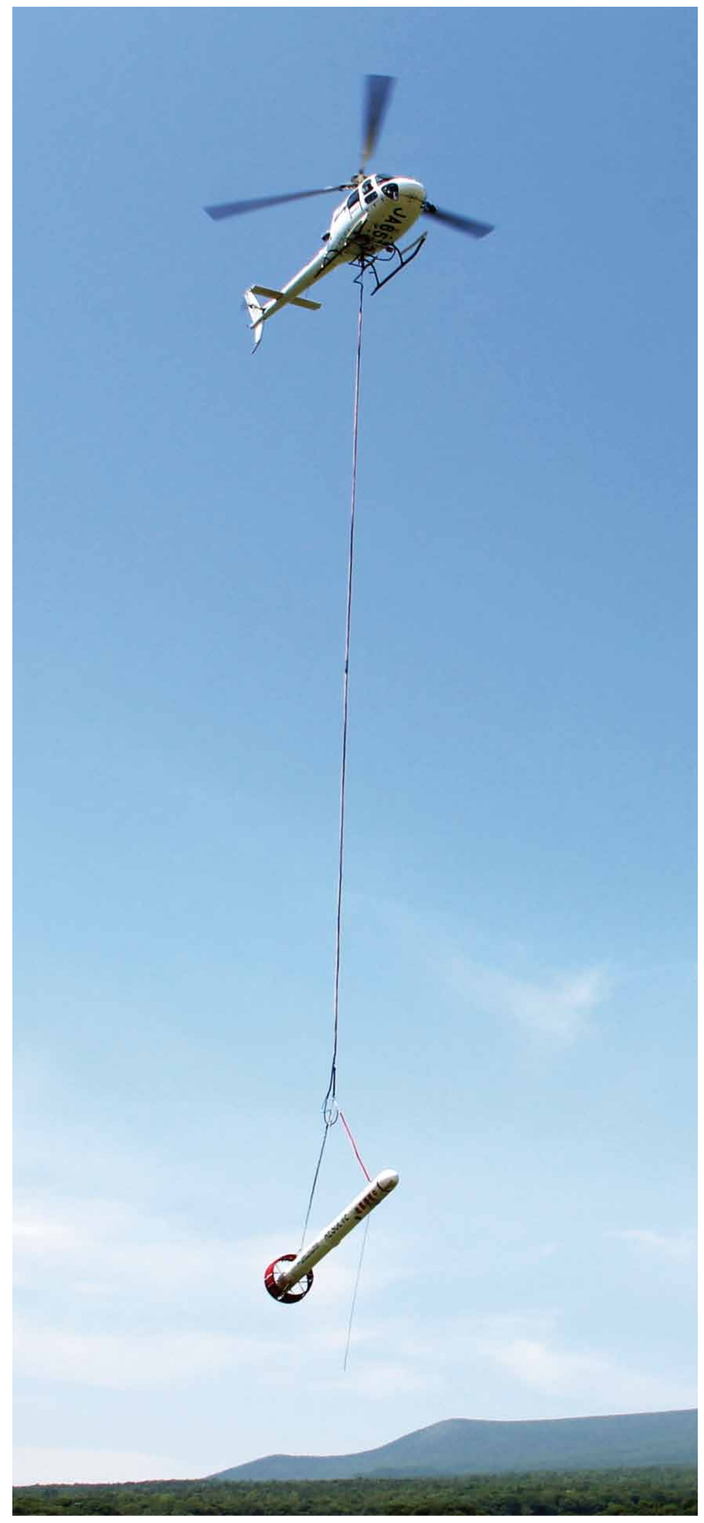
1. Since this survey is conducted from the air, it can acquire ground information efficiently on large hillslope area without on-site investigation or modification of land.
2. It can gather the spatial ground information which is unacquirable by one-dimensional geographic survey such as boring exploration.

Helicopter

-The survey takes a place at flight altitudes of approx.60m.
-The remote control device of the sensor and the recording device are loaded into the helicopter.
-The helicopter is also equipped with a GPS antenna and radio altimeter antennas.

Electromagnetics Sensor : BIRD

-BIRD is a cylindrical container, length approx.10m, in which both transmitting coil and receiver coil are housed.
-The heights of BIRD is approx. 30m above the ground during the survey.
-BIRD is also equipped with a GPS antenna and a magnetometer.



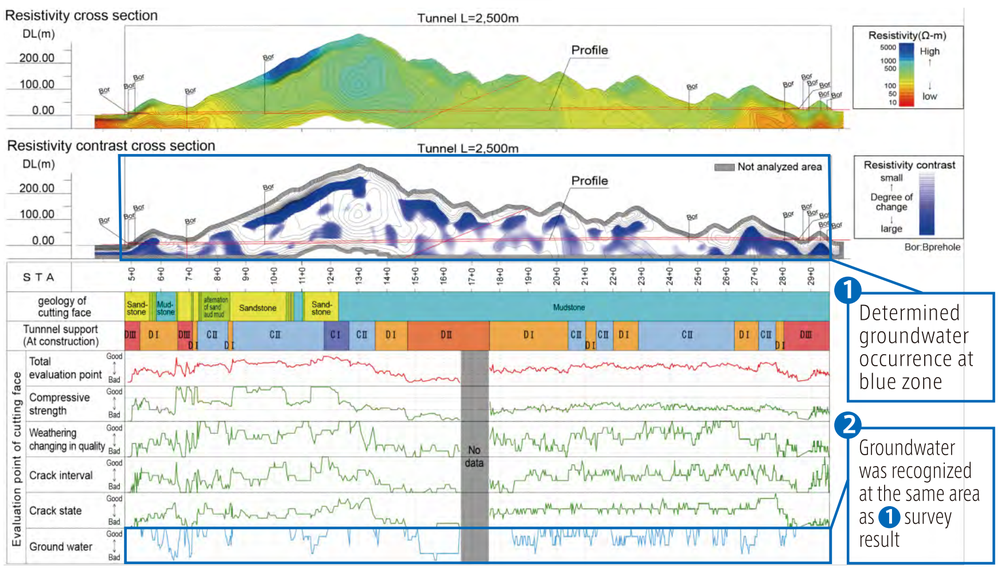
Case Study

▶Pre-Survey of Tunnel Construction

It is important to confirm the groundwater layer before tunnel construction.

As a result of the survey, resistivity contrast cross section showed groundwater would occur at blue zone(1).

Groundwater was recognized at the same area as a survey result during tunnel construction(2).



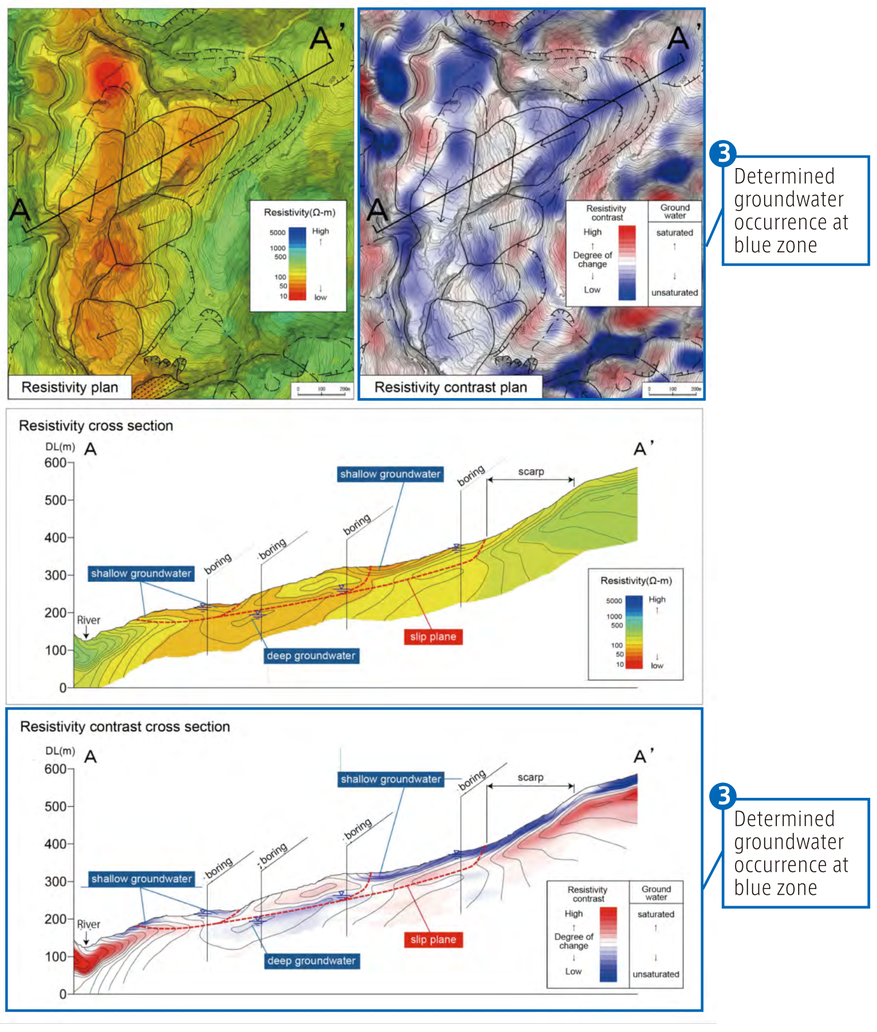
▶Survey of Landslide Prevention

Groundwater is one of the causes of occurring landslide. It is important to confirm the distribution of groundwater for water discharge.

As a result of the survey, resistivity contrast plan and cross section showed groundwater would occur at blue zone(3).

AEM survey brings about efficient outcome to perceive geological structure and condition of groundwater.


Kurikoma Mountain, Miyagi prefecture



Application Experiences

AEM method is being utilized as a efficient technique for geological survey, landslide survey, and various kinds of route study in extensive region or hard access area of mountainous region.
It is also applied as the one of techniques to identify the vulnerability of hillslope in surveys for prevention of sediment disasters which frequently occur in Japan.

Application Experiences

(Cases)

Sabo Survey (Deep-Seated Landslide, etc.)	16
Landslide Survey	17
Volcanic Disaster Prevention Survey	16
Road Disaster Prevention Survey	12
Route Survey	57
Tunnel Survey	23
Groundwater Survey	7
Survey of Dam Project	25
Land Survey, Geological Survey, et al.	13
TOTAL	**186**

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