Dipole Testing Method ASTM D7007

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DIPOLE TESTING METHOD

The Dipole Testing Method is used with earthen or water covered geomembranes, typically to verify that an installation has not been damaged during the backfilling process. This method has a sensitivity of 6.4mm in diameter for soil covered geomembranes and 1.4mm in diameter for water covered geomembranes.

METHOD

For an earthen covered geomembrane, the survey area is required to be electrically isolated from the surrounding earth. Ideally an isolation trench should surround the testing area, with the geomembrane exposed. Before the survey can be carried out conductive objects such as metal sump pipes, access roads and standing water are required to be removed.

For a water covered geomembrane, conductive objects are similarly required to be isolated in the installation as these will provide false readings. The electrical conductivity of the water must also be known to calibrate sensitivity levels for the survey meter.

A high voltage DC power source is applied to the medium above the geomembrane and grounded to the conductive surface underneath. Measurements of voltage potential are taken using a dipole probe in a grid pattern throughout the surface of the survey area. Void locations can be pinpointed by a characteristic sine wave pattern in the voltage field across the location of a leak. Data collection and voltage mapping are often used with this method to provide quality assurance documentation and additional survey oversight.

Several Dipole types may be used to survey the installation depending on site specific conditions, these include specialist testing probes for highly conductive covering materials, remote GPS survey technology for geomembranes that are not easily accessible by an operator and multi-dimensional testing dipoles.

SUMMARY

The sensitivity of the Dipole Survey Method is highly dependent on site conditions such as the moisture content, depth and mineralogy of the cover material for soil-covered geomembranes and the electrical conductivity of solution-covered geomembranes. The dipole survey method is the only method that can be used to confirm integrity of an installation after being covered by materials.