The research results will be the basis of numerical groundwater flow models of the slope and will be also used to design and the whole slope.

Case of Study

The Ca' Lita landslide is located in Northern Apennines of Italy, within the special plan area, at an altitude ranging from about 300 to 400 m above sea level. The monitoring network consists of seismic stations, inclinometers, groundwater level sensors, and drain wells. The total reactivation occurred in winter 2005, when a total rainfall of 1,500 mm was recorded in the Ca' Lita area. After the reactivation event, only little deformation have been recorded in the inclinometers. Two in-place inclinometers were installed in the landslide body: the first one was placed in the head zone, while the second one was placed in the middle zone of the landslide. The inclinometers were monitored continuously by electric transducers with a time resolution of one day. The results of the inclinometers have been analyzed. After 1 year from injection, no evidence of the tracer in the landslide was found. Different interpretations are possible: 1) the tracer test was not performed correctly, 2) the tracer was not able to move through the landslide body, 3) the tracer was diluted by groundwater flow, 4) the tracer was not able to reach the monitoring system, or 5) the tracer was not able to be detected by the monitoring system.

Groundwater level monitoring

After the last reactivation event, occurred in winter 2005, only little deformation have been recorded in the inclinometers. Two in-place inclinometers were installed in the landslide body: the first one was placed in the head zone, while the second one was placed in the middle zone of the landslide. The inclinometers were monitored continuously by electric transducers with a time resolution of one day. The results of the inclinometers have been analyzed. After 1 year from injection, no evidence of the tracer in the landslide was found. Different interpretations are possible: 1) the tracer test was not performed correctly, 2) the tracer was not able to move through the landslide body, 3) the tracer was diluted by groundwater flow, 4) the tracer was not able to reach the monitoring system, or 5) the tracer was not able to be detected by the monitoring system.

Geochronological characterization

The Ca' Lita landslide is located in Northern Apennines of Italy, within the special plan area, at an altitude ranging from about 300 to 400 m above sea level. The monitoring network consists of seismic stations, inclinometers, groundwater level sensors, and drain wells. The total reactivation occurred in winter 2005, when a total rainfall of 1,500 mm was recorded in the Ca' Lita area. After the reactivation event, only little deformation have been recorded in the inclinometers. Two in-place inclinometers were installed in the landslide body: the first one was placed in the head zone, while the second one was placed in the middle zone of the landslide. The inclinometers were monitored continuously by electric transducers with a time resolution of one day. The results of the inclinometers have been analyzed. After 1 year from injection, no evidence of the tracer in the landslide was found. Different interpretations are possible: 1) the tracer test was not performed correctly, 2) the tracer was not able to move through the landslide body, 3) the tracer was diluted by groundwater flow, 4) the tracer was not able to reach the monitoring system, or 5) the tracer was not able to be detected by the monitoring system.

Hydrogeologic characteristics of roto-translational slides in flysch rock masses

To evaluate the hydraulic conductivity of the landslide body, the test showed a hydraulic conductivity of type 1 (in meters/day) and 1.5 (in meters/day).

Tracer test

The Ca' Lita landslide is located in Northern Apennines of Italy, within the special plan area, at an altitude ranging from about 300 to 400 m above sea level. The monitoring network consists of seismic stations, inclinometers, groundwater level sensors, and drain wells. The total reactivation occurred in winter 2005, when a total rainfall of 1,500 mm was recorded in the Ca' Lita area. After the reactivation event, only little deformation have been recorded in the inclinometers. Two in-place inclinometers were installed in the landslide body: the first one was placed in the head zone, while the second one was placed in the middle zone of the landslide. The inclinometers were monitored continuously by electric transducers with a time resolution of one day. The results of the inclinometers have been analyzed. After 1 year from injection, no evidence of the tracer in the landslide was found. Different interpretations are possible: 1) the tracer test was not performed correctly, 2) the tracer was not able to move through the landslide body, 3) the tracer was diluted by groundwater flow, 4) the tracer was not able to reach the monitoring system, or 5) the tracer was not able to be detected by the monitoring system.

This hypothesis seems the less reasonable, considering that the gas exchange between landslide and the landslide body was investigated by means of a tracer test with a fluorescent dye solution (0.5 g of dye solution added to a known volume of groundwater) at the toe of the landslide, and that a low tracer concentration was detected in the landslide body. The dye concentration was measured at the toe of the landslide, and that a low tracer concentration was detected in the landslide body. The dye concentration was measured at the toe of the landslide, and that a low tracer concentration was detected in the landslide body. The dye concentration was measured at the toe of the landslide, and that a low tracer concentration was detected in the landslide body. The dye concentration was measured at the toe of the landslide, and that a low tracer concentration was detected in the landslide body.