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CASE HISTORY

Consolidation of a failed slope between Prenestina New state highway and the Prenestina Old road, Fiuggi, Frosinone, Italy

PRODUCT	TENAX TT 400 and TENAX TT 300 SAMP geogrids
LOCATION	Fiuggi (FR), Italy
OWNER	Comune di Fiuggi
PROJECT	Dr. Ing. Pietro de Carolis
CONTRACTOR	Ondino Romeo - Napoli

PROBLEM

Fiuggi is a small town in central Italy which has for centuries been famous for its spa waters. It is situated on sloping terrain, with abundant subterranean water flows, in an area of seismic activity.
These factors cause numerous problems to the stability of the land in the surrounding areas. Along the connection road between the Prenestina Nuova state highway and the Prenestina Vecchia road, a landslide occurred halfway down a slope with a gradient of between 20 and 30 degrees.
This area was intended for residential development and bordered a geo-hydraulic basin which is a source of the spa waters. The landslide front measured approximately 300 m and its depth between 10 and 15 m.
The failure surface was close to a plane and the foundation soil had a very low bearing capacity.

SOLUTION

The landslip was consolidated using the reinforced soil technique. The fallen soil (which consisted of silt of pyroclastic origin and reworked clay of colluvial origin) was replaced with other materials with better mechanical characteristics which were available on site (volcanic pozzolan).
This was then reinforced with TENAX TT 400 SAMP and TENAX TT 300 SAMP geogrids.
The installation of the geogrids was performed, in terms of the special demands of the project, using the "wrap-around" method: the geogrids were laid and fixed using "U" pegs; soil was then spread and compacted; the geogrids were then turned over and re-fixed.
The job was extremely simple and was performed by unskilled labour using normal soil moving equipment.
The job was completed with the addition of non structural concrete panels (used for their attractive appearance) along the service road, which was located half way down the slope, and at the foot of the slope.
The problem of drainage was solved by putting coarse gravel between the reinforced soil wall and the concrete panels, thus creating a drainage channel.

CONCLUSIONS

The consolidation of the landslip through soil reinforcement with TENAX TT SAMP geogrids meant that:

- it was possible to consolidate the slope under difficult natural conditions;
- it was not necessary to use foundation piles which may have interfered with the subterranean flow of water;
- it was possible to utilise a fill soils found on site which meant notable financial savings.