

SUCCESS STORY

MONITORING TILT OF GEDIMINAS' TOWER IN LITHUANIA++

COUNTRY:

Lithuania

SECTOR:

Civil Infrastructure Operators

PROJECT TYPE:

Tilt Monitoring

MAIN PRODUCT:

Loadsensing | Tiltmeter

Challenge

Gediminas' Tower is part of the Vilnius Castle, the Palace of the Grand Dukes and the National Museum of Lithuania. The remaining part of the upper brick castle was completed in 1409 by Grand Duke Vytautas. In spring 2016, part of the North side of Gediminas' Hill started sliding. The area is protected with a temporary geotextile white cover.

Landslides at Gediminas' Hill have made the news many times. There is a lot of pressure from the media on getting Gediminas' slope and Hill back to its original state and re-opening the site to the public. The site and the funicular are currently closed to visitors.

Solution

Before Christmas 2016, GPS Partneris approached Worldsensing partner Geosense with an urgent requirement to monitor the landslide taking place in this historic site. While different options were considered, six biaxial Loadsensing wireless tiltmeters and one Gateway were installed. The aim of the installation was to activate an on-site landslide alert and to control any movement in two retaining walls – a small stone one at the top and a main masonry wall at the bottom.

Installation of the wireless Loadsensing monitoring system was done in one day on Wednesday January 18th, 2017, with temperatures well below 0°C. GPS Partneris installed the biaxial tiltmeters within 0.5 degrees both in A and B axis, using special brackets designed by Geosense.

GPS Partneris installed eight monitoring prisms at the end of December 2016. While they were surveyed by an Automatic Total Station every hour, it became clear a more accurate measuring system was needed. Results from monitoring prisms were in the range of ± 0.5 mm of real resolution, but the wireless tilt meters' resolution and repeatability are ± 0.03 mm/m. Biaxial tiltmeters have been set to measure every hour to give an earlier on-site warning than monitoring prisms.

The Loadsensing monitoring solution is the first wireless, remote control system installed in Lithuania. 6 biaxial tiltmeters have been set to measure every hour to give an earlier on-site warning.

ADVANTAGE

- 11 Biaxial tiltmeters
- 3 on brackets onto existing retaining walls
- 3 on stakes in the landslide
- GPRS Gateway, mains connected
- 8 monitoring prisms

Benefits

The Loadsensing monitoring solution is the first wireless, remote control system installed in Lithuania.

Remote access to the Loadsensing tiltmeter system has been successful both via SIM card and on Ethernet while temporarily locating the gateway 7 Km away from the site at GPS Partneris' offices. Readings are currently stable and GPS Partneris are hoping to increase the number of biaxial Loadsensing tiltmeters installed on-site in the coming months.

GPS Partneris and the Contractor were impressed by how easy the installation was and by the data's immediate availability and reliability.



*Figure 1:
Gediminas' Tower is part of the Vilnius Castle, the Palace of the Grand Dukes and the National Museum of Lithuania.*



*Figure 2:
Loadsensing Wireless Tiltmeter, a 2-in-one sensor + data node*



Find out more:

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