

Casablanca's Medina Buildings Monitored during Tunnel Construction



Vibrations during the construction of a new 1,890m tunnel adjacent to Casablanca's Old Medina, the 250-year-old section of the famed Moroccan city, challenged the stability of its historically important buildings. It was essential to monitor in real time the effects on the Medina's aging buildings and to confirm that the construction work meets all engineering standards and guidelines. Therefore ETAFAT, a geospatial information acquisition and processing company, used the Nikon XF total station to perform more than 100 daily inspections.

The ETAFAT team relied on optical targets placed on building facades whose coordinates were determined by forced centering to complete the inspections. Headquartered in Casablanca, Morocco, [ETAFAT](#) is a continent-wide leader in the acquisition and

processing of geo-spatial information, specializing in innovative technologies in geomatics.

According to ETAFAT engineers, the [Nikon XF 1"](#) with its fast autofocus function, saved considerable field time. The Nikon XF 1" is a mechanical total station that stands up to the toughest worksite conditions. This tool enabled very fast collection of highly accurate observations throughout the monitoring and control of the planimetric and altimetric locations of the structure. The monitoring of the buildings during the various phases of the tunnel's construction generated a large amount of data essential for understanding the consequences of the work and defining any necessary corrective measures.

Digital terrain modelling and cubature calculations

In addition to the important task of monitoring the integrity of the buildings, the Nikon FX 1", with its advanced options and Survey Pro software, enabled survey teams to quickly yet accurately perform a variety of other essential field tasks. These tasks include digital terrain modeling (DTM), cubature calculations, COGO topometric calculations, and layout control with customized report generation. The use of Survey Pro software also had the added advantage of permitting ETAFAT engineers to fully integrate their total station work with their fleet of Spectra Geospatial SP60 GNSS receivers.

The new Les Almohades tunnel, beneath the Boulevard des Almohades, runs parallel and adjacent to the old Medina. Together with its 380 meters of access roads, the twin-tube tunnel, which carries traffic in two unidirectional lanes in each tube, was constructed to reduce traffic congestion.