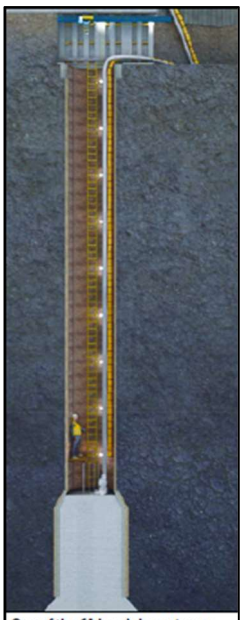
Claridge's Hotel London

In 2015 when the owners of arguably the most famous hotel in the world wanted to extend the property, the only viable option was to go down. The challenge of constructing a five-storey basement beneath a working hotel, frequented by the rich and famous, was taken up by contractor McGee and designer Arup. Such a sensitive project required the best possible monitoring, and this was duly provided by Geotechnical Observations.



One of the 61 hand-dug caissons with a temporary steel lining, widened out below the bottom of the new basement where it was backfilled with concrete to form a new pile © McGee

The 1920's eight-storey building is supported by 61 steel columns resting on a 1.1m thick, 50m by 25m reinforced concrete raft directly below the lower ground floor. The construction sequence was to hand dig 61 caissons up to 30m deep, creating new reinforced concrete piles and taking the loads from the weak silty gravels that lies immediately below the raft to the more competent London Clay. The rest of the ground would then be carefully removed to form the five levels of underground space, all whilst maintaining a regime of no noise and no vibration, so as not to disturb the hotel, which remained operational throughout. The safety and stability of the hotel and its guests was critical at every stage.

To carefully record the movements of the building Geotechnical Observations installed a network of liquid levelling cells. Constraints within the operational building layout meant that it was impossible to link all of the cells in the same system so a total of nine dependent systems were created. Each system was connected to the next virtually to relate the movements to a stable point outside the zone of influence.

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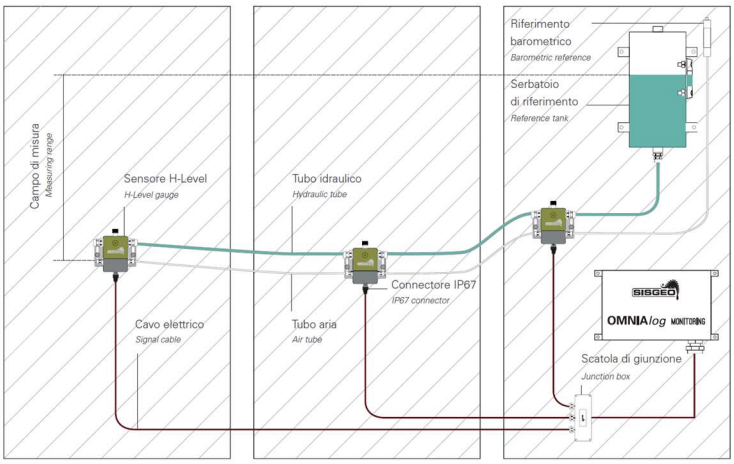

The pictures show how liquid levelling sensors are connected to a fluid reservoir and detect relative movements between the sensors. One sensor and the reservoir are located in a stable location or where the movements can be independently checked and used as a reference point. The sensors are very sensitive and cannot tolerate large changes of absolute elevation so when this occurs two sensors are positioned alongside each other and the displacements are transferred virtually.

All of the measurements are collected remotely and can be presented on our web-based Geodaisy® software (shown above) with contours to make it easy to understand where the movements are happening.

The project was a huge success and has been awarded several prizes including the prestigious British Geotechnical Association Fleming Award in 2018.

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