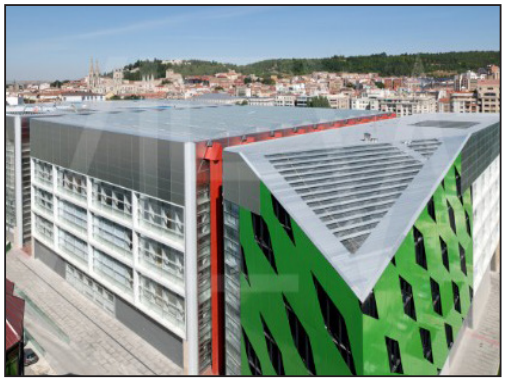
GEOSENSE

Case Study - Deep Foundations

Museum of Human Evolution, Spain



PROJECT SUMMARY

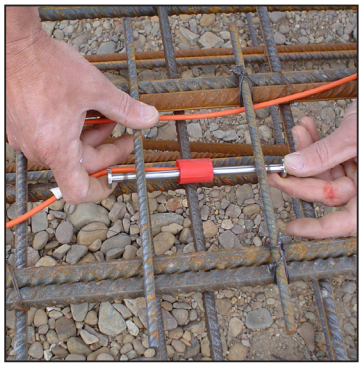
NAME: Museum of Human Evolution, Burgos

YEAR: 2004 - 2005

CLIENT: Municipality of Burgos

MAIN CONTRACTOR: UTE Cnes. Aragón Izquierdo S.L.- Arranz Acinas S

INSTRUMENTATION SPECIALIST: KellerTerra



OVERVIEW

Work on the site began in 2004 and The Museum of Human Evolution was inaugurated on July 13, 2010. Its foundation is based on the archeological site of Atapuerca, located 20 km (12 miles) east of Burgos. The Atapuerca site has been designated a UNESCO World Heritage Site.

The specialist geotechnical company KellerTerra were contracted to construct the deep foundations which would be used to support the structure and for underground parking and the lower levels of the museum.

Part of this deep foundation required the construction of a diaphragm wall to a depth of approximately 20 metres.

MONITORING

Data on diaphragm wall deflection was regularly monitored to ensure construction quality and the safety of adjacent buildings, particularly important given its high density urban setting. Due to the depth of the excavation and the proximity of ancient buildings, extensive monitoring was necessary within the diaphragm walls by means of embedded vibrating wire strain gauges and inclinometer casing. From this the load on the diaphragm wall and deflection could be measured. Tie back anchors were monitored using vibrating wire anchor load cells.

All strain gauges were connected to a data logger and Monitoring Point, a web based data visualisation software where the data could be viewed through the internet. Pre-set trigger levels were set and a regime of alarms developed as part of the construction safety system.

Inclinometers were also installed around the excavation to measure any movement of ground.

PRODUCTS USED

VWS-2100 embedment strain gauges
To monitor strain within the cage.

Inclinometers & inclinometer casing
To monitor movement in and around the retaining walls.

VW anchor load cells
To monitor the load within the ground anchors.

GeoLogger data logger
Captures data, stores it and uploads to the internet.

MonitoringPoint
Visualisation software to provide information in 'real time'.

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