



Madrid High Speed Railway, Spain



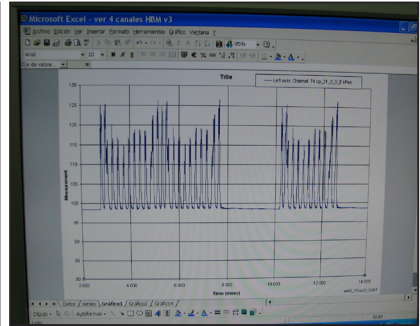
PROJECT SUMMARY

NAME: Madrid High Speed Railway

YEAR: 2006

CLIENT: CEDEX

MONITORING CONTRACTOR: Proel



OVERVIEW

Alta Velocidad Española (AVE) is a service of high-speed rail in Spain operated by Renfe, the Spanish national railway company, at speeds of up to 310 km/h (193 mph)

AVE trains run on a network of dedicated high-speed rail track. The first line was opened in 1992, connecting the cities of Madrid and Seville. Unlike the rest of the Spanish broad-gauge network, the AVE uses standard gauge, permitting direct connections outside Spain in the future.

A large country that is sparsely populated in much of the interior, the government intends that all provincial cities will be less than four hours travelling time from the capital, Madrid, and six and a half hours from the second city and economic giant, Barcelona.

Geosense instrumentation has been used in a test project and is also installed along a section of the new track.

MONITORING

As part of an extensive research and development programme for the new Trans European Railway network CEDEX installed for the Spanish AVE system a series of Total Pressure Cells (TPC) were used to monitor the loading underneath their long-term laboratory simulation test rig. They were also used to monitor loading underneath the live track at Canto Blanco.

The TPCs were fitted with strain gauge pressure transducers to provide dynamic monitoring of the loading. Results were analysed in conjunction with the results from the live track installation at the CEDEX research centre in Madrid.

Geosense products were chosen due to their high accuracy and robustness under the extreme site conditions and the data gathered helped provide vital information for ongoing safety and performance criteria.

PRODUCTS USED

Total Earth Pressure Cell TPC-4000

Total Earth Pressure cells were used to measure the stress transfer through the ballast and on the underside of the sleeper.

CEDEX interpretation software

Used to interpret the stress transfer.

Intelligent readout

Portable readout to monitor and record readings from total earth pressure cells.

Heavy duty armoured cable

Used to resist heavy loading within the ballast.