Geophysical Research Abstracts
Vol. 16, EGU2014-7506-1, 2014
EGU General Assembly 2014

GPR applications in Civil Engineering in Spain - state-of-the-art

Vega Pérez Gracia (1), Mercedes Solla (2), Sonia Santos-Assunçao (1), and Henrique Lorenzo (3)

(1) Department of Strength of Materials and Structural Engineering (RMEE). Politechnical University of Catalonia, EUETIB/CEIB, C/ Urgell 187 08036 Barcelona (vega.perez@upc.edu, 00 34 93 4137401), (2) Defense Center University (University of Vigo), Spanish Naval Academy, Plaza de España 2, 36920, Marín, Pontevedra, Spain, (3) EUET Forestal, University of Vigo. Campus A Xunqueira s/n. 36005-Pontevedra. Spain

GPR was introduced in Spain in 1990, and the first significant work was the PhD thesis of H. Lorenzo in 1994. Due to its versatile applicability, the employ has been increased and actually, GPR is extensively used in detection of pipes, wiring and urban services mainly. During the last years, this method was also widely utilized in the detection of graves from the civil war and in forensic studies, with irregular results. It was also commonly applied in archaeology.
Actually exists more than 20 private companies offering geotechnical services by means of GPR. Also, several public institutions as Universities and Research Institutes base part of their research in GPR or in GPR applications. Notwithstanding, no training courses of specific formation on GPR is offered, but in several doctorate programs it is possible to work with GPR. Also, in many schools, GPR is part of the geophysical formation of graduate students.
However, no national guidelines and rules exist, and each company defines the investigation protocols. Nevertheless, one of the aims of the Comisión Española de Geodesia y Geofísica (Spanish Committee for Geodesy and Geophysics) is to define guidelines for the GPR studies. Probably, the existence of national guidelines or perhaps European guidelines could be the most effective way to promote the responsible use of GPR in different domains. On the other hand, perhaps recommendations on the use of combined methodologies could be a practical way to persuade in the application of geophysical non-destructive technologies.
The CEDEX, Centro de Estudios y Experimentación de Obras Públicas (Center for Studies and Experimentation in Civil Engineering), which is a civil engineering research agency in Spain, offers different test sites to calibrate and evaluate the method. It is an autonomous organization, organically ascribed at present to the Ministry of Fomento, and functionally ascribed to the Ministries of Fomento and Medioambiente of Spain, giving assistance to various administrations, public institutions and private companies. What is more, some of the existing private companies have also minor test sites to analyze the behavior of the signal and its propagation depending on the type of asphalt concrete.
GPR is used mainly in detection of pipes and urban services and various private companies are specialized in these tasks. Another widespread application is archaeological survey; one private company is also specialized in archaeology evaluations, using GPR combined with magnetometer. Forensic examinations are also common applications in Spain. Other less common applications are: regular inspection of roads, bridges and tunnels, cultural heritage buildings assessment, shallow geology studies and quality control in civil engineering.

Acknowledgment

The study is a contribution to the EU funded COST Action TU1208, "Civil Engineering Applications of Ground Penetrating Radar".