

Distribution of surface deposits in the Gijón urban subsurface (NW Spain)

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Gijón is the second most populous city (278.285 inhabitants in 2015) of the Spanish north coast. The urban subsurface is mostly formed ($\approx 80\%$) by Quaternary sediments which exceeds 20 meters of thickness when cover the Jurassic carbonate basement (Gijón Formation).

This work has allowed to know the spatial distribution of the different types of sediments in urban area. To do this, a GIS database was developed that contains data from more than 450 geotechnical reports. Information provided by fieldwork and the exploration of excavation works in progress throughout the city was also incorporated. Currently, the geodatabase developed comprises more than 1,400 site investigation points: boreholes, dynamic probing and trial pits. This has been supplemented with hundreds on-site and laboratory tests carried out on core samples of soils and rocks, performed following renowned testing standards.

Quaternary formations, largely concealed below man-made fills, set up two main areas composed by granular and cohesive soils: the littoral zone at the northern urban perimeter and the continental zone at the southern sector. The first one, fluvial-marine deposits, consist of sandy sediments related to beach/dune systems and marsh deposits, with gravels, organogenic mud and layers of Holocene peat. The southern area is composed by residual clays –silt and coarse-grained soils to a lesser extent– linked to the dissolution of the Mesozoic substrate. Associated with these two types of deposits, two main aquifers can be differentiated.

The thickness of the man-made deposits, fluvial-marine sediments and residual deposits was determined in this work. Thus, a 3-d model of Gijón subsurface at urban scale was obtained. A map of the Jurassic bedrock bedrock was also produced.

Building construction works may be affected by the geotechnical behavior of the Quaternary deposits and the saturation of granular sediments. This is because the shallowness of the water table, the usual low bearing capacity and other issues such as clays consolidation or swelling phenomena. The use of concrete slabs, deep foundations and piled/anchored retaining walls is very common when projecting underground floors under these conditions.