

The Middle Globigerina Limestone, Malta

A study into the geotechnical characteristics with reference to engineering situations.

28th October 2020 - 3.30 - 5.00 pm

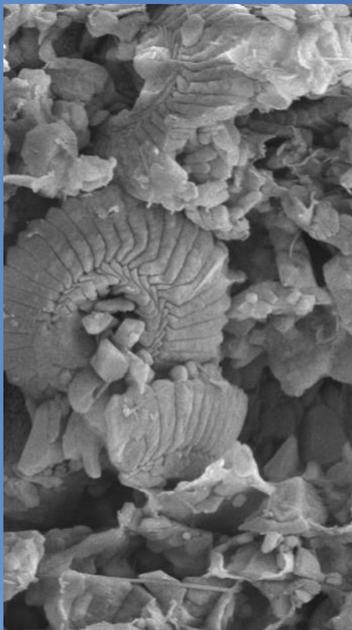
[WEBINAR LINK](#)



Adrian Mifsud



L-Università
ta' Malta



The geology of the Maltese Islands has been extensively studied over the last two centuries, but very little attention has been given to the geotechnical behaviour of the various layers. This is a first attempt at detailed investigation and engineering analysis of one of the weaker rock layers of the Maltese stratigraphy (the Middle member of the Globigerina Limestone formation), presenting the possible methodologies and the theoretical background through which this can be done.

The different facies are presented as weak materials which need to be excavated and built upon, citing the structural problems at the old church of Santa Marija Church, in Mrieħel, as an example of the implications of their engineering behaviour. All these are very fine-grained limestones, formed of planktonic remains that are clay-sized but not necessarily clay-like. Three distinct materials of slightly different plasticity and mineralogy are considered in detail.

The microstructure of these sediments is explored through mineralogical studies, geotechnical index tests and the use of the scanning electron microscope, with the aim of understanding how these materials have been formed, what they are made of and what makes them different. Compressibility characteristics are studied by high-pressure oedometer tests with pore pressure measurement, and shear behaviour with the use of low-pressure and high-pressure triaxial tests.

Classical soil mechanics theory, combined with recent advances in understanding the geotechnical behaviour of hard soils and soft rocks, are shown to be valid approaches in understanding these materials. Structure, in the form of fabric and bonding, and particulate behaviour, as influenced by pure friction and dilatational characteristics between particles, are both explored, and their interplay is investigated as the source of strength and deformability characteristics of these materials.

