

Geotechnical Engineering Lecture Series

Speaker: Sebastiano Foti

Civil Engineering
Politecnico di Torino

Dates: April 16 and 20

Time: >> see each lecture <<

Location: SEB 122

Lecture 1 (Monday 4/16 at 2 pm): Soil porosity and geophysical tests (seismic and electrical)

Void ratio is a parameter of great significance for the mechanical behaviour of soils. Still its assessment is not a trivial task especially for coarse soils, in which this parameter assumes the highest importance (e.g. for seismic and static liquefaction). Biot's theory of wave propagation in saturated porous media provides an useful framework in this respect, allowing for the use of seismic tests for the evaluation of soil porosity, as it will be shown using laboratory and in situ experimental data. On the other side also electrical properties of soils are strongly related to soil porosity and can provide very effective tools for the recognition of soil dishomogeneities. In this respect an application of electrical tomography in the laboratory will be presented, highlighting also its potential for the monitoring of transient processes in soils both in 2D and 3D applications.

Lecture 2 (Friday 4/20 at 11 am): Uncertainty assessment in surface wave tests

Surface wave tests are widely used for site characterisation especially in soil dynamic and earthquake engineering applications. Uncertainties in the estimated small strain stiffness profile arise from both experimental and model uncertainties. In particular the solution of the inverse Rayleigh problem introduces some uncertainties related both to the choice of the reference model for the interpretation and to the non-uniqueness of the solution. Some experimental results will be shown to provide an insight on the different uncertainties and on the assessment of test significance in different situations. Finally the implications of non-uniqueness of the solution will be explored with particular reference to the evaluation of seismic site response, adopting a Montecarlo approach for the inversion of surface wave data.

Prof. Sebastiano Foti received his PhD degree in Geotechnical Engineering from Politecnico di Torino in 2000. He has been Visiting Research Scholar at Georgia Institute of Technology, Atlanta (USA) and Research Associate at the Centre for Offshore Foundation System of the University of Western Australia in Perth. Currently he is an Assistant Professor at Politecnico di Torino, where he teaches Soil Dynamics and Geotechnical Earthquake Engineering and Geotechnics. His research is mainly related to geophysical methods for geotechnical characterisation, with particular reference to surface wave testing, seismic waves in porous media and use of geophysical techniques in the lab. Other research interests comprise soil-structure interaction, bridge scouring assessment on the basis of structural dynamics and earth retaining systems in seismic zone. He has published over 50 papers in scientific journals and technical conferences and three book chapters. He has been awarded the Geotechnical Research Medal (Bishop Medal) 2003 by the Institution of Civil Engineers, UK. For more information, visit his home page at <http://www2.polito.it/?????????>