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The importance of understanding the interaction between a structure and the ground on which it is supported was recognised long ago, but it took pioneers such as Prof Tschebotarioff to document procedures for qualitatively accounting for this interaction. Foundation structure interaction or FSI is now widely recognised as a key component of design considerations for most structures including tall, large or fragile (heritage) buildings, retention systems and excavation support, tunnels, dams, bridges etc. Whilst our tools for undertaking foundation structure interaction (FSI) analyses and our understanding of soil and rock behaviour have increased significantly since the days of Prof Tschebotarioff and particularly so in the last two decades, the fundamentals of FSI remain the same. However, perhaps because of increasing complexity of the tools available and/or the ease at which these tools can be used (or mis-used) by inexperienced but otherwise competent engineers, these fundamentals are too often forgotten, and can lead to both overly conservative and unconservative designs.

Through a series of case studies, this presentation provides some insights into FSI analyses that are undertaken on a daily basis by geotechnical engineers operating out of commercial consulting and design offices. Particular emphasis is given to understanding the key aspects of the soil/rock behaviour that influence the performance of the structure – an aspect that is too often ignored in the analysis. Examples covered will include foundations for super tall towers and heritage structures, support of deep excavations and performance of deeply buried culverts.

Brief Resume

Dr Chris Haberfield is a Principal Geotechnical Engineer with Golder Associates Pty Ltd. He has extensive research and practical experience in foundation structure interaction in all types of soil and rock but in particular in soft, weak and weathered rock. Of direct relevance to this talk, Chris has been responsible for review, value engineering, engineering design, analysis, construction and testing advice for numerous low to very high rise commercial and residential towers, deep basements, road/rail separations, bridges, embankments, tunnels, mines, dam foundations and other developments and infrastructure projects in a wide range of ground conditions from soft soil to hard rock.