



DONGJU LEE MEMORIAL LECTURE

Department of Civil Engineering and Engineering Mechanics
Columbia University

Geotechnical Issues of Megaprojects in Problematical Soil Ground of Kazakhstan

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After the collapse of the Soviet Union, Astana has become the new capital of Kazakhstan. In the past decade, many modern architectural and engineering megaprojects have emerged (such as Khan-Shatyr, Peace Palace – Pyramid, house estate of “Severnoe Siyanie” and so on). These modern megaprojects put forward new requirements to engineers utilizing more economical and technologically effective design and construction methodologies. The territory of the city of Astana is located on the Kazakh Steppe and the most apparent problem is the soil condition presented by inhomogeneous sandwich soil layers, characterized by various types of soft and dense soil, and hard soil bands, including freezing ground. At present, pile foundations are widely used, but it is very hard to use precast piles because they may break in the soil during driving or their heads may be damaged too, while the bearing capacity is not high. The best geotechnical solution in this case is the use of new pile technology like CFA (continuous flight auger), FDP (full displacement piles), DDS (drilling displacement system) and H-beam piles, that lead to increased bearing capacity. The present lecture includes static and dynamic, integrity piling test results and also data of numerical analysis of interaction of piles with soil ground. The case study on several Megaprojects in problematical soil ground of Astana and also in West Kazakhstan (Caspian Sea area) will also be presented.

About the Speaker: Dr. Askar Zhussupbekov is Professor of Civil Engineering, Head of Department of Civil Engineering and Director of Geotechnical Institute at Eurasian National University, Astana, Kazakhstan. He graduated from Saint-Petersburg State Architectural and Civil Engineering University (SPBGASU), Russia, in 1977 and he obtained Ph.D. in specialty “Soil Mechanics and Foundation Engineering” from SPBGASU in 1985. Dr. Askar Zhussupbekov defended the degree of Doctor of Technical Sciences in specialties 05.23.02 “Foundation Engineering and Underground Structures” and 25.00.22 “Geotechnology” from Karaganda State Technical University, Kazakhstan in 1996. He has won many awards including: Laureate of the Lenin Komsomol Scientific Award, USSR Award; Silver Medal of International Exhibition VDNH of USSR; Medal “Honorary Builder of Kazakhstan”; Medal of Russian Geotechnical Society for Best Paper; Scientific Grant “Best Professor for 2006” of Ministry of Education and Science of Kazakhstan. He has published more than 230 scientific papers including 3 books on Geotechnical Engineering, and served on the Editorial Board of International Journal of Geotechnical Engineering (USA). He has been a scientific supervisor for more than 25 Dr. Ph.D. dissertations and 10 Dr. Engineering dissertations. He supervised also foreign Dr. Ph. D. students dissertations from Japan, Turkey, South Korea, Cambodia, Tajikistan, and Mongolia. He has contributed greatly to the scientific and engineering activities as a scientific consultant of some scientific developments during the first stage construction of some unique industrial objects at Karachagnak gas-condensate field, the Caspian pipeline complex (Atyrau, NPS-2), the second generation plant in Tengiz, a refinery plant in Karabotan (Atyrau), an industrial community in Tengiz, office buildings, civil engineering objects and houses on the left bank of Ishim river in Astana city, Kazakhstan. Prof. Askar Zhussupbekov was elected Vice-President of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) for Asia (2009-2013). He has given keynote lectures at international geotechnical conferences and symposia held at all six continents.

The Dongju Lee Memorial Lecture was established with a generous contribution from the Lee Family. DJ, as Dongju preferred to be called, passed away on February 26, 2003 while he was a student working toward the doctoral degree. We would like to express our gratitude to DJ's father, Prof. Yong-won Lee, for his support in establishing the Lecture and an Award. DJ obtained his Master's and Professional degrees from Columbia University.