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**GEOTECHNICAL CHALLENGES OF MEGA PROJECTS**

**ON PROBLEMATIC SOILS OF KAZAKHSTAN**

Just as every civilization in the history is originated from the riverside, so the city of

Nur-Sultan - new capital of Kazakhstan has been developed around the Ishim River. As its result, there are many bridges across the river. Also high rise building such Palace of Peace, Khan Shatyr, Abu-Dhabi Plaza, Ministry of Transportation Buildings, International Astana Airport, Mosque Hazret Sultan, New Railway Station, Expo2017 , LRT construction site and other many megastructures founded in problematical soil ground of Astana. These unique buildings need performing of deep driving and boring piling foundations. For designing of piling foundations on difficult soils are important investigations of behavior of piles by using of dynamic, static, O-cell, integrity piling tests. Also now we have development of geotechnical infrastructures of Megastructures in West Kazakhstan( Caspian Sea area). This paper includes of fresh results of several piling tests with comparison of numerical analysis by FEM. These investigations of interaction of piles with soil ground of new capital are important for understanding of mechanism of working of different piles on soft and hard soils of Nur-Sultan and West Kazakhstan. Also this paper introduced of experiences of piling constructions in winter season on freezing ground. The lecture includes recommendations and conclusion with proposing of methodic for the obtaining of bearing capacity and settlements of driving and boring piles on problematical soil ground of Nur-Sultan with Geoinformation Data Base . For Central Kazakhstan was provided of Complex Testing of New Conical Foundation on undermining soil ground of Karaganda coal prefecture. This presentation also included fresh information about the results of interaction of joint piles on difficulty soil ground of New Sea Port “ Prorva on coastal area of Caspian Sea at West Kazakhstan and Megastructure Bakad in Almaty.