

عنوان مقاله:

Numerical Modelling of Size Effect on Subgrade Reaction Modulus Using DEM

محل انتشار:

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خلاصه مقاله:

In the flexible foundation analysis theories, such as beam on elastic foundation and Winkler's model, the modulus of subgrade reaction is proposed as the soil's resilience coefficient in a semi-infinite environment. The modulus of subgrade reaction is usually determined in field-study form and through the plate loading test. One of the influential parameters in the modulus of subgrade reaction is the size of the particles and aggregates. The present research has evaluated the effect of particle size on the modulus of subgrade reaction using numerical simulation and discrete element method. To this aim, samples with completely identical granulation conditions as well as samples with relatively uniform granulation, having finite particle range were modeled in different sizes and stress-displacement variations were measured in them through the discrete element method. Given the uniformity of type and shape of the aggregates, the results of the numerical modeling show that the medium size has a direct relationship with the modulus of subgrade reaction of the sand; specifically, in the high percentage density, increase in size of the aggregates greatly increases the modulus of subgrade reaction. These variations are almost linear in completely uniform aggregates and show a relatively logarithmic process in samples with a limited size range.

کلمات کلیدی:

Size effect, Modulus of subgrade reaction, Discrete element method, Uniform sand, Plate load test

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