

SIMULATION AND PREDICTION OF THE EFFECTS OF CONTAINED EXPLOSIONS IN WATER-SATURATED SANDS BY NUMERICAL MODELS

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Up till recently the effects of contained explosions (camouflets) in water-saturated sands, had to be assessed by experimental means. However, a computer code has now been developed to predict such effects as degree of liquefaction, densification and settlement. The computer code is based on the theory of explosion dynamics and on an empirical soil model.

The program system is able to cope with single and with multiple explosions, including delay mechanisms, to enhance liquefaction effects. The quantitative results depend on the reliability and the extent of soil information.

Although the model can operate in a deterministic mode, the stochastic mode is preferred because of the non-linearity of the phenomena.

During 1983 and 84 large multiple explosion operations for 2 projects took place in the NL. Before and during these operations extensive testing, checking and refining of the model has taken place.

The results of computer simulation are compared with geotechnical centrifuge modeling tests. The size of the charges was selected in accordance with the range of the in-situ verified results and earlier work on centrifuge modeling in connection with the tests on the Meppen Proving Grounds.