# Bessel functions in problems of inhomogeneous soil consolidation

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**Abstract**: Soil modulus of deformation which continuously increases with depth, are called continuously inhomogeneous. In this paper, the inhomogeneity represented as follows:

$$E = E_m(\alpha+\beta z)^m \quad (\alpha>0,\ \ E_m>0,\ \ \alpha+\beta z>0),$$

where $E_m, \alpha, \beta, m$ are experienced parameters.

On the basis of this dependence consolidation problems of elastic and elastic-creeping inhomogeneous soils are solved applied to the restricted area sealing. These solutions make it possible to calculate the values of the pore pressure, the sum of the principal stresses and vertical displacements of the points of the upper surface of the sealed inhomogeneous soil mass.

In these solutions for strongly compressible saturated clay soils also considers that at the initial time of the load, the applied load $q$ instantly to the ground, which is equal in magnitude to structural strength compression $p_{cmp}$ immediately perceived by soil skeleton.

In addition, Darcy's law is violated, i.e. considered the initial pressure gradient. The resulting formulas are presented as a combination of Bessel functions of the first and second kinds. Given that it is now possible to determine the value of any of the Bessel functions, it is possible to calculate the pressure in the pore fluid and predict rainfall velocity the sealed array. Similar problems in various formulations are investigated in [1-2].

**Keywords:** soil, consolidation voltage deformation modulus, pore pressure.

References:

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