

**FINITE ELEMENT PROGRAM "GEO" FOR MODELING
BRITTLE-DUCTILE DETERIORATION OF AGING EARTH STRUCTURES**

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ABSTRACT

The constitutive equation GEO was formulated to develop a finite element program capable of modeling the aging deterioration and time-dependent failure of earth structures. The validation of the equation has been proven by successfully modeling the full scope of material failure from elastic deformation to postfailure behaviors in three dimensions. The GEO program is found to be useful in a wide range of applications, including soil, soft rock, fractured rock, dry mining, solution mining, underground storage operations, earth construction work (dams, tunnels, and foundations), and earthquake prediction studies.