The problem of numerical simulations of gravity waves appearing in stably stratified flows is addressed. This numerical study presents the results of simulations of stably stratified wall-bounded flows. The effect of artificial far-field boundary conditions is studied in detail. The two- and three-dimensional tests are performed for the case of flow over a low isolated hill. The simulations on computational domains with three different heights are discussed to evaluate the performance of the new far-field artificial boundary condition. The model is based on Boussinesq approximation of non-homogeneous Navier-Stokes equations, solved using artificial compressibility method, looking for a steady solution.