Currently, the development of underground construction, multi-tunnel engineering has become a matter of concern since the interaction between tunnels at close ranges could cause additional deformation in surrounding structures and even serious damage to surface buildings. These tunnel displacement and soil deformation can be predicted using numerical methods considering the influence of various factors, such as the nature of sand soil. The elasto-plastic constitutive model is implemented in finite element to investigate deformation problems in the strata and nearby structures caused by the excavation of multi-tunnels. This paper focuses on configurations of two crossing tunnels. Multiple 3Dnumerical simulations using ansys enable successive analyses conducted for tunnels at different spacings (1.5D, 2.5D, 3.5D and4.5D, where D is the tunnel diameter) of configurations vertically. The results, including the ground settlement and tunnel convergence, are analyzed. For each results, the most unfavorable case is determined by comparing the resultsof different cases. This investigation can provide a reference for multi-tunnels design and construction.