

Serviceability of cut slope and embankment under seasonal climate variations

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Abstract	In the next 20 years, there will be an extensive investment in transport infrastructure. Although the cut and embankment slopes seem to have the same appearance, they have different responses to climate variations. Understanding their characteristics and performance is necessary to design a safer and more sustainable slope infrastructure. This paper provides a thorough examination of the seasonal performance of cut slopes and embankments. Furthermore, this study suggests an introduction to the impacts of climate change, amplifying seasonal shrinkage-swelling and progressive failure of slope construction under extreme drought and precipitation. Volumetric water content and pore water pressure fluctuations due to seasonal variation were analysed and compared from both the cut slope and the embankment. Moreover, stress path and slope deformation were also investigated in this study to understand the behaviour of the cut slope and the embankment. The results suggest that the cut slope retains more pore water pressure during the wet season due to its lower permeability than an embankment with respect to the construction history. However, pore water pressure and displacement in the cut slope tend to be increased due to the consolidation process after excavation, which requires more time to reach equilibrium. In addition, greater displacement in the cut slope can increase the possibility of delayed failure in the future.
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