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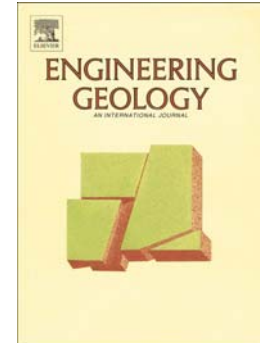
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Typical embankment settlement/heave patterns of the Qinghai–Tibet Highway in permafrost regions: formation and evolution

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Abstract

The Qinghai–Tibet Highway (QTH) in China has been experiencing a serious embankment settlement/heave for more than half a century. The settlement/heave is resulted from several mechanical processes taking place in different soil layers. In this paper, four typical settlement/heave patterns of road embankments in permafrost regions, namely “steady-low rate”, “fluctuate”, “down step” and “steady-high rate” are proposed based on 3-year monitored data of embankment settlement/heave and ground temperature at four road sections as well as previous published data of the QTH. Their formation mechanisms and evolution trend in the process of permafrost degradation are discussed from the viewpoints of engineering geology and mechanical process, based on the clarification of the deformation characteristics of different soil layers of a typical road embankment. The results show that the four patterns are caused by the negligible

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