

可调控通风管路基的降温效果

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摘要 可调控通风管路基是一种理想的保护高温冻土的工程措施。针对青藏铁路高温冻土段存在的冻融问题, 考虑太阳辐射和附面层对边界条件的影响, 通过对传统和可调控通风管路基进行详细的数值仿真分析, 结果表明: 可调控通风管路基在夏季(8月份)0℃的等温线比传统的通风管路基要高, 说明其冻土上限抬升较高, 冻土会得到更好保护, 并且其路基下面也不会出现融化盘; 冬季(3月份)-4℃的等温线传递深度要比传统通风管路基深, 其对路基基层冻土的降温速度和冷却效果要明显优于传统的通风管路基。

关键词 [土力学](#); [青藏铁路](#); [可调控通风管路基](#); [降温效果](#); [数值分析](#)

分类号

COOLING EFFECT ON ADJUSTABLE VENTILATED EMBANKMENT

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Abstract

The adjustable ventilated embankment, which is adopted in Qinghai-Tibet Railway, is an ideal engineering measure to protect warm frozen soil. Aiming at the freezing-thawing problems of warm frozen soil where Qinghai-Tibet Railway has been constructed, this paper has considered the influence of solar radiation and the adherent layer on the boundary conditions and has performed detailed numerical simulation analysis and comparison between the traditional ventilated embankment, in which both ends of the ducts are open, and the adjustable ventilated embankment, in which both ends of the ducts are closed. The numerical results show that the location of 0℃ isotherm of the adjustable ventilated embankments is higher than that of the traditional ventilated embankment in summer season. It shows that the permafrost table is lifted more under the adjustable ventilated embankment and the permafrost underlying is protected better. And it does not occur the thawing bulb in summer. On the other hand the propagation depth of its -4℃ isotherm is larger than that of the traditional ventilated embankment in winter season. These indicate that the cooling effect of the adjustable ventilated embankments on permafrost is quite better than that of the traditional ventilated embankments.

Key words [soil mechanics](#); [Qinghai-Tibet Railway](#); [adjustable ventilated embankment](#); [cooling effect](#); [numerical analysis](#)

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