

目次

青藏铁路片石通风试验路基沉降与普通路基裂缝解剖分析

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**摘要** 青藏铁路清水河多年冻土试验段, 平均海拔4 470 m, 冻土年平均地温为-1.40 ℃~-0.46 ℃, 冻土上限为1.5~3.5 m, 2001年9~11月施工。2002年10月前后, 路基相继出现多条纵向裂缝。为研究试验段路基裂缝成因及片石路基沉降量较大等问题, 2003年5月对DK1026+630和DK1025+583断面进行解剖分析, 如实记录开挖路基基本情况, 进行现场和室内试验, 分析路基沉降和裂缝形成规律, 计算路基沉降量。结果表明, 路基沉降由在外荷载作用下路基本体的压密沉降和基底以下地层的压密和融化沉降两部分组成, 由于两个路基断面填料压实度均匀良好, 其沉降量主要来自于地层的压密变形和融沉, 路基沉降量的计算值与实测值基本一致。DK1026+630断面裂缝贯穿路基本体, 为融沉裂缝, 是由于路基阳侧原天然地面下泥灰岩风化物融化压缩引起路基体横向不均匀沉降造成的。由于片石有调解人为上限形态和抑制路基不均匀变形的作用, 故片石路基没有产生融沉裂缝, 但在竣工初期却表现出较大的沉降量。

**关键词** [土力学](#) [青藏铁路](#) [片石通风路基](#) [沉降](#) [普通路基](#) [裂缝](#) [解剖分析](#)

分类号

**DISSECTION AND ANALYSIS OF SETTLEMENT OF RUBBLE VENTILATION EMBANKMENT AND CRACK OF ORDINARY EMBANKMENT IN PERMAFROST REGIONS**

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**Abstract**

The permafrost experimental segment is located in the region of Qingshui River along Qinghai—Tibet Railway, with an average elevation of 4 470 m, mean annual ground temperatures between -1.40 ℃ and -0.46 ℃ and permafrost table in the range of 1.5 to 3.5 m. It was begun to construct in September, 2001, finished in November, 2001. The many longitudinal cracks of roadbed emerged in succession in October, 2002 or so. for the sake of the research on the reason of cracking of roadbed and the larger settlement of rubble stone ventilation embankment, the cross-sections of DK1026+630 and DK1025+583 were chosen to dissect in May, 2003. The basic conditions of roadbed after excavation were really recorded, at the same time the field and laboratory tests were conducted. The settlement of roadbed and the regular pattern of cracking were also analyzed. Lastly the settlement of roadbed was theoretically calculated. The above results indicate that the settlement of roadbed is composed of both the compressive settlement of roadbed body and the thaw and compressive settlements for frozen subgrade under the external loads. Because the compaction degree is an even and good in two cross-section of roadbed, the settlement of roadbed primarily consists of thawing and compressing deformation in the base strata. The calculating values of settlement of roadbed are basically in accordance with real measuring ones of that. The crack in cross-section DK1026+630 pierces through the roadbed body and belongs to thaw-settlement fissure, which is caused by differential cross settlement of roadbed that is formed on the basis of thawing and compressing settlement in weathered marl under base surface in the sun side of roadbed. Since the rubble can adjust the shape of artificial permafrost table and control the differential cross settlement of roadbed, the rubble ventilation embankment shows a larger settlement in the initial period of completion it without thaw-settlement fissure.

**Key words** [soil mechanics](#) [Qinghai—Tibet Railway](#) [rubble ventilation embankment](#) [settlement](#) [ordinary embankment](#) [crack](#) [dissection and analysis](#)

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· <a href="#">韩文峰</a>
· <a href="#">蒋富强</a>
· <a href="#">牛怀俊</a>
· <a href="#">谌文武</a>
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