

## 地层沉降和井壁附加应变实测耦合分析

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### In-situ tests on ground surface settlement and additional strain of shaft linings

摘要

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**摘要** 深厚表土中的井壁与发生沉降或抬升的地层之间, 由于相互耦合会产生力的作用。在采用注浆加固地层治理井壁破裂时, 地层会产生抬升, 而在注浆休止时, 地层又会有一定的沉降, 在地层的抬升和沉降过程中会对井壁的附加力产生一定的影响和改变。通过井壁上监测的附加应变的变化以及地层沉降位移的变化之间分析对比, 数据曲线表明: 地层沉降和井壁之间有良好的相关性, 地层抬升时, 井壁附加应变减小; 地层沉降时, 井壁附加应变增加。因此通过地表沉降测试数据能反映出井壁所受附加力的大小, 对于没有埋设监测系统井壁, 可以通过地表沉降数据来反应井壁附加力的大小, 据此来预测井壁的安全状况。

**关键词:** 立井井壁 附加应变 竖直附加力 地层注浆 沉降 抬升 实测

**Abstract:** More than 100 shafts have ruptured in China during the past three decades. The vertical additional force is regarded as the mechanism of the rupture. Grouting of the surrounding soil to reduce the additional stress is found to be an effective method to cure the shafts. During the grouting period, the ground surface around the shafts upheaves, and the additional stress decreases. During the non-grouting period, the ground surface subsides, and the additional stress increases. The strain of shaft linings and the settlement are highly consistent. The additional force can be obtained from the settlement of the ground surface for the shafts without stress state monitoring system.

**Keywords:** shaft lining additional strain vertical additional force grouting settlement upheaval in-situ test

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