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A review of floor heave mechanisms in underground coal mine roadways

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ABSTRACT

This paper reviews the floor heave mechanisms in coal mine roadways and relevant cases. Previous studies have reported three main mechanisms: bearing capacity failure; buckling; and swelling. The buckling failure is observed where immediate floor strata are relatively strong. On the contrary, the weak floor strata have been associated with both the bearing capacity failure and swelling mechanisms. The bearing capacity failure of floor is likely to induce other types of instability such as pillar punching, tensile failure of pillar, roof fall and subsidence as well as floor heave. Despite a considerable amount of research, predicting the magnitude, location and timing for floor deformation is challenging with current state of knowledge.