

The ultimate limit state of the underground circular tunnel segment lining

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Abstract. Circular tunnel segment lining with staggered joints in track tunnels of Prague Underground was found to be on the ultimate limit state; static analysis (mathematical modeling) is used to determine the causes which led to such situation. This situation is signalized by cracks and related deformations; lining load-limit coefficient can be used to determine the cause. Analysis is performed in the form of parametric study, where the variables are the values of geotechnical figures, the rigidity of the lining with staggered joints and the load of the lining. This paper focuses on analysis of reinforced concrete segmental lining Ø5.3 / 5.8 m (5 + 1 element) and cast iron Ø5.1 / 5.5 m (9 + 1 element). Parametric study using coefficient of loading limit for both of these cases in the Prague Underground leads to fast and relatively easy determination of the cause of the reaching of the ultimate limit state.