

Can a single-column pier bridge overturn?

The overturning process of single-column-pier bridges is well revealed in these studies, and the results show that the overturning can be effectively judged by the support reaction, i.e. when the reaction of some bearing has a negative value, the structure is considered in the risk of overturning.

How to analyze overturning limit analysis of a single-column pier bridge?

Analytical method for overturning limit analysis of single-column pier bridges  
Monitoring and evaluation of overturning resistance of box girder bridges based on time-varying reliability analysis  
Measurement of the dynamic displacements and of the modal frequencies of a short-span pedestrian bridge using GPS and an accelerometer

Is bridge overturning anti-resilience?

Whereas overturning is one of the worst anti-resilience scenarios, the resilience design against bridge overturning is highlighted through a detailed discussion including the calculation methods of anti-overturning factor, overturning stability of curved bridges, reasonable disposition of supports, and anti-overturning countermeasures.

Is a single-column pier bridge safe?

To ensure the safety and applicability of the single-column-pier bridge, it is necessary to study its overturning mechanism and develop a real time monitoring system of overturning risk. To investigate the overturning mechanism, extensive studies have been performed on the overturning-stability-checking method, .

How can a bridge overturning risk monitoring system be used?

This can be achieved by using specific bridge monitoring systems. Existing bridge overturning risk monitoring systems can be divided into two categories. One is to monitor the relative displacement between the measurement points near the bearing on both sides of the girder, and further judge if the bearing is disengaged.

What is anti-overturning moment?

The anti-overturning moment can be equivalent to the resultant moment of two sides support reactions, which is about the axis of overturning. It should be noted that lateral support reaction is not necessary for the judgement of overturning risk since it contributes little to the anti-overturning moment.

**Abstract:** The main manifestation of the overturning process of the bridge is the rigid body rotation of the main girder, and the roll moment generated by the vehicle partial load ...

Compared to double-column pier bridges, single-column pier bridges generally have poor anti-overturning capacity due to their single-support structural form in the transverse ...

To evaluate its anti-overturning performance reasonably, it is crucial to determine the reaction force of the support for the single-column pier girder bridge. However, due to the interaction ...

For bridges where overturning accidents occur, the piers are mostly in the form of a single column or similar single-column piers, and the bearing spacing is small or a single support, resulting in a small anti ...

However, the one-point support design of the single-column piers would reduce the stability of bridges, especially when all vehicles happen to move eccentrically along the same outer lane ...

Through comparison of the results, a relationship between the parameters of the single-pier bridge and the anti-overturning ability is obtained, which provides a theoretical ...

Seismic isolation of railway bridges using a self-centering pier  $M = (N+G) \cdot B/2$  (1) In Fig. 2 and Eq. (1),  $N$  is the supporting force of the pier top;  $G$  is the self-weight of the ...

When the loading ratio of live loads is 60% - that is, the vehicle gravity is taken as 60% of its actual gravity - the coefficient of the anti-overturning stability is 1.591 and the ...

Taking a high-speed three-span box girder ramp with a single pier in Kunming China as an example, a spatial finite element model is established to analyze the anti-overturning stability ...

The results show that the anti-overturning moment of single column pier girder bridge includes the moment around the rotation center generated by self weight and support ...

overturning stability of a single-pillar pier bridge. Song et al. [9] used the anti-overturning stability coefficient calculation formula provided by the code to carry out the anti-overturning ...

with poor anti-overturning capacity due to its single-point-support structural form in ... there will be a risk of overturning on the single-column-pier bridge (Peng et al.2014; Liu et al.2015 ...

