

## Single Tower Ground Anchored Suspension Bridge

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### ABSTRACT

China is a country dominated by mountains and plateaus, accounting for about 70% of the total land area. Unlike other countries, a large number of people live in the western mountainous areas, and there is a strong demand for modern infrastructure.

Lvzhijiang bridge is located in the Yuxi Chuxiong Expressway in Yunnan Province, crossing lvzhijiang River. The vertical height from the bridge deck to the top of the mountain is 330 meters, and which is 320 meters from the bridge deck to the river. Traditionally, suspension bridges have one cable tower on each side to support the main cable. In the construction process of lvzhijiang bridge, we proposed the solution of single tower ground anchored suspension bridge due to the site conditions on one side of the canyon, which is almost a cliff.

The main span of Lvzhijiang Bridge is 780m, the east side span is 140m, and there is no west side span. The stiffening beam is steel box girder with the total length of 711m. The terrain on the west side is steep. In order to avoid mountain excavation, the integral steel box girder is adjusted to separated steel box girder to enter into the tunnel, so the tunnel portal section is expanded. Unlike other saddles, we designed a totally new type of saddle, roller combined cable saddle.

Single tower ground anchored suspension bridge is suitable for extreme terrain conditions, which can avoid a lot of excavation and has obvious environmental protection effect.

**Keywords:** single tower ground anchored suspension bridge, roller combined cable saddle, steel box girder, cliff, environmental protection