

Dear Reviewer:

We gratefully thank you for your constructive remarks and useful suggestions, which have significantly improved the quality of the manuscript and have enabled us to refine it. Below are our responses to the reviewers' comments, point by point, and the revisions are indicated.

Reviewer

General Comments:

However, the research question connected to the PSRW (pile slab retaining wall) may be better highlighted in the introduction, by placing it in a separate paragraph, together with the figures.

Reply:

We are deeply grateful for your invaluable suggestions. After meticulous consideration, we have revised the capacity of this section. The revised content is presented below:

In response to the challenges posed by steep terrains, narrow site conditions, and suboptimal foundation conditions in mountainous terrain, Hu et al. (2019) introduced the PSRW structure. This structure comprises a buffer layer and an anti-slide pile-slab system, which has found widespread application in southwestern China (Fig. 1). Due to the use of pile foundations, this structure exhibits characteristics such as a small footprint, high interception height, and ease of construction.

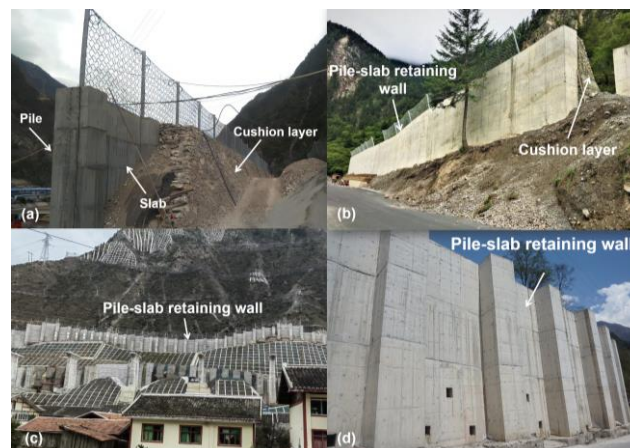


Fig. 1. PSRW in south-western China (a) Kongyu town (b) Jiuzhaigou nature reserve (c) Zhenjiangguan tunnel exit in Chengdu-lanzhou railway (d) Zhangmu town

However, the current PSRW design verification approach treats the structure as either an underground continuous wall (CAGHP, 2019) or an elastic cantilever beam (Tian et al., 2024). The structural design primarily considers the impact force of falling rocks as the sole external influencing parameter, while the impact energy is seldom taken into account. Furthermore, existing research primarily focuses on single slabs and piles impacted by rockfall (Wu et al., 2021; Yong et al., 2021). Consequently, due to the scarcity of comprehensive research reports on the ultimate load-bearing capacity of this structure, it is frequently overlooked during the initial selection of protective structures, and potential failure scenarios may be underestimated (Fig. 2). Additionally, because of the composite nature of this structure, the dynamical response at various impact points remains elusive.



Fig. 2. Some PSRW in Zhangmu Town were damaged by falling rocks.