

Review of the manuscript No. egosphere-2023-2715 ‘Dynamic Response of Pile-Slab Retaining Wall Structure under Rockfall Impact’ submitted to NHESS.

Recommendation: **accept.**

Focus of the paper: The pile-slab retaining wall which is useful for in rockfall mitigation engineering.

Relevance: The presented study is the original primary research within the scope of the journal.

Abstract is well written and clearly describes the undertaken study.

Structure: The article is well organized with structured sections.

Introduction presents a background, defines research goals and provides a clear statement of research problem. It presents the purpose of the research investigation which is supported by the pertinent literature. Literature is well referenced and relevant.

Research questions and goal are identified. Objectives are relevant to the study aim.

Research gaps and weakness in former works are described; the existing gaps are identified.

Motivation: The pile-slab retaining wall is attributed to its excellent impact resistance, substantial interception height, and reliable structural durability.

English language: acceptable. Clear, unambiguous, professional English language used throughout.

Data used in this study are described. Data are explained, sources are mentioned.

Methods: The authors presented numerical experiments which investigate the dynamic response of a pile-slab retaining wall under the various impact conditions of rockfall. Methods are explained.

Results are reported: Results reveal that during the impact process, the stress, strain, and concrete damage of the structure gradually spread from the impact center to entire structure and ultimately result in permanent deformation. Utilizing found relationship, the authors estimated maximum impact energy that the pile-slab retaining wall can withstand

Discussion interpreted the major outcomes of this study: The authors found that the lateral displacement of the pile at the ground surface and the concrete damage under the pile as the impact center is greater than those under the slab as the impact center, implying that the impact location has a significant influence on the stability of the structure.

Conclusion The authors concluded that there is a positive correlation between the response indexes (impact force, interaction force, lateral deformation of pile and slab, concrete damage, and the impact velocities. Conclusions are well stated and linked to original research question.

Actuality, novelty and importance of the research is clear: the authors revealed that within the discussed impact scenarios, the rockfall peak impact force, the ratio of peak impact force to peak interaction force, and lateral displacement of pile at the ground surface had strong linear relationships with rockfall energy.

Academic contribution: The paper increases the knowledge in civil engineering. The paper deserved to be published in *NHESS*.

Figures Figures are of acceptable quality, easy to read, relevant and suitable.

Recommendation: This manuscript can be accepted based on the detailed report above.

With kind regards,

- Anonymous Reviewer.

10.04.2024.