

REVIEWER'S REPORT

Manuscript No.: **IJAR-53312**

Date: 16-08-2025

Title: Technical And Investigation Of Soil Mechanics In The Sei Balai Cliff Reinforcement Project, Batubara District

Recommendation:

Accept as it isYES.....

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality			✓	
Techn. Quality		✓		
Clarity			✓	
Significance		✓		

Reviewer Name: Mir Bilal

Reviewer's Comment for Publication.

Abstract Review:

The abstract introduces the study by emphasizing the importance of cliff reinforcement in addressing geotechnical challenges, particularly in landslide-prone areas such as Sei Balai, Batubara Regency. The geographical coordinates of the study site are provided, giving precision to the research location. The soil type is identified as sandy silt (silty sand to sandy silt), highlighting its implications for slope stability. The abstract presents detailed findings from cone penetration testing (CPT) at two points (S-1 and S-2), reporting cone tip resistance (qc) values across different depths. Additionally, soil bearing capacity values obtained through hand drilling tests (HB 1 and HB 2) are presented, offering quantitative insight into subsurface conditions. The study concludes by underscoring the role of these results in planning cliff reinforcement to ensure slope stability and infrastructure safety. The abstract combines context, methodology, results, and significance in a comprehensive manner.

Introduction Review:

The introduction situates the research within the broader context of geotechnical engineering challenges in landslide-prone areas. Sei Balai is presented as a critical site due to its geological and hydrological vulnerabilities along the river system, which pose threats to both infrastructure

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and community safety. The section underscores the importance of soil mechanics in planning reinforcement measures, linking physical and mechanical soil properties to slope stability and structural safety. It details the specific field investigations undertaken, including sondir testing and hand drilling, as key sources of data on cone tip pressure (q_s) and soil bearing capacity (f_s). The problem formulation is presented clearly in four guiding questions, addressing soil mechanics, cone tip pressure and bearing capacity values, soil suitability for reinforcement, and the determination of the most effective reinforcement method. This structured formulation provides a strong analytical framework for the study.

Literature Review Review:

The literature review begins with an overview of soil investigation methods, emphasizing their implementation through field observation and soil testing. Field observations are described as necessary for assessing surface conditions and gathering contextual information from local residents, particularly regarding hard soil depth. The static cone penetration test is highlighted as a primary technique for determining cone resistance (q_c) and friction resistance (f_s), which serve as key parameters for calculating soil bearing capacity. This section establishes the technical foundation for the study by outlining the methods and rationale for soil mechanics investigations in reinforcement projects.

Overall Assessment:

The abstract, introduction, and literature review together present a clear and well-structured study. The abstract concisely summarizes objectives, methods, and results. The introduction provides context, rationale, and guiding questions, while the literature review grounds the methodology in established geotechnical practices. Collectively, they establish a solid foundation for a technical investigation focused on ensuring slope stability and infrastructure safety in Sei Balai, Batubara District.
