Review of: "Enhancing Soil Stabilization in Soft Soils Through The Addition of Sand to Soil-Cement Piles: a Comprehensive Study"

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Potential competing interests: No potential competing interests to declare.

Title: **Enhancing Soil Stabilization in Soft Soils Through The Addition of Sand to Soil-Cement Piles: a Comprehensive Study**

Major Comments: The author has given more literature, but the citations are missing. Abstract needs modification. There are no details regarding the composition of ECO CSSB. The physical/mechanical properties of soil and other materials used in the study should be provided. The author mentions many factors such as particle size, density, moisture content, road construction, cost-effectiveness, durability, stability, etc., in literature and conclusions, without providing any test data. Also, chemical changes, SEM images/XRD pattern changes of modified soil are missing.

Detailed Comments

Abstract

Statement: When cement is mixed with soil, the cement particles will react with water and minerals in the soil, forming a hard bond.

Comment: Replace the word ‘hard bond’.

Statement: This article focuses on researching the mixing of soil and cement materials to reinforce weak soil in Ben Tre province.

Comment: The word ‘reinforce/ reinforcement’ will be specifically used for steel/fiber inclusion in the mixes. Therefore, in the entire manuscript, the use of this word will be misleading.

Statement: Experimental results show that when sand and additives are added, the hardness and load-bearing capacity of the soft ground increase significantly.

Comment: How to find the hardness of a soil-cement mixture? Is the word ‘hardness’ technically relevant?

Introduction

Comments: In every paragraph, literature is provided with a lot of data, but no citation is found. In the second paragraph, for soil-cement mixture, the type of soil used should be mentioned; otherwise, the information may lead to ambiguity.

Statement: The quality of cement and construction processes are crucial factors affecting the available strength of the mixture.

Comment: What is available strength?

Statement: Soil exploration should be conducted at a high density to achieve economic efficiency.

Comment: Whether the term ‘high density’ is correct here?

Statement: The effectiveness of soil stabilization is contingent upon several factors, with construction equipment and added components being pivotal elements.

Comment: What are those “added components” being pivotal elements?

Statement: Table 1. Method of soil stabilization using inorganic binders.

Comment: So many treatment options are given for improving soil properties, but the major drawback of this paper is that citations are not provided.

Statement: Fe2O3, MgO, and Al2O3,…

Comment: Correct for subscripts.

Statement: ECO CSSB

Comment: What is the full form of ECO CSSB? What is its composition?

Statement: To delve deeper into the factors contributing …..

Comment: Rectify spelling mistakes.

Research on Weak Soil Improvement

Comment: What are the mechanical/ physical properties of soil, cement, and other additives?

Statement: The construction of cement-soil-cat mixes was ….

Comment: What is “cat”?

Statement: Table 2. Uniaxial compression test results for non-saline samples at 18 days

Comment: Mention ‘compressive strength along with unit’ in the Table itself. Also, modify column titles for clarity.

Statement: Compressive strength (qu) 314.502 kPa

Comment: Here decimal values don’t have any significance. Therefore, values can be modified to full digits like 315 kPa.

Statement: Table 3

Statement: Volume of Sand Mix, 100liters/m3…..

Comment: Check for units. Also, mention the material for 100liters/m3 to improve clarity.

Statement: Table 2, Table 4.

Comment: Why are the test results provided only after 18 days? And in Table 4, where are the results for 300liters/m3?

Comment: The author highlighted particle size, moisture content, natural density, specific gravity, etc., in detail. It is observed that in the results these factors are not given any importance. What is the reason? What is the particle size distribution before and after amending the sand?

Statement: Conclusions

Comment: Why is there “Conclusion” and “Overall Conclusion”?

Statement: Increasing the cement content further results in a higher compressive strength, but not significantly and not economically feasible.

Comment: Where is the economic analysis to justify this statement?

Statement: The findings are expected to be applicable in treating weak and saline soils, such as in constructing pond dikes, preventing riverbank erosion, and rural road construction, ensuring cost-effectiveness while maintaining the durability and stability of the structures.

Comment: The author introduces terms such as road construction, cost-effectiveness, durability, stability, etc., without giving any data/analysis? This is the lacuna.