

<https://doi.org/10.5281/zenodo.11259232>

## A Comparative Study of CSEB by Using RHA & LIME as a Partial Replacement of Cement

KalpanaYadav<sup>1\*</sup>, Anusha Giri<sup>1</sup>, Bimala Shrestha<sup>1</sup>, Kiran Gurung<sup>1</sup>, Asmita K.C<sup>1</sup>, Bipashwi Karki<sup>1</sup>, Gyanendra Bhandari<sup>2</sup>

<sup>1</sup>BE student, Oxford College of Engineering and Management, Gaindakot, Nepal

<sup>2</sup>Asst. Prof., Department of Civil Engineering, Oxford College of Engineering and Management, Gaindakot, Nepal

\*Corresponding email: kalpanayadav573@gmail.com

\*ORCID: 0009-0003-7050-6840

### Abstract

The increasing awareness of sustainable building materials and environmental issues, Compressed Stabilised Earth Brick (CSEB) gives the view of energy efficient, cost reduction, and environmentally friendly building materials, overall contribution to sustainable development. It turned out that CSEB properties can be very easily compared with other materials such as concrete blocks or traditional fired bricks.

This research investigates the properties & internal mechanisms of soil blocks made with two different materials i.e. RHA & Lime. Experiments were conducted & the main variables included were sample (0.2, 0.4 & 0.6 wt. %) RHA content and (0.2, 0.4 & 0.6 wt. %) Lime content. Tests include Atterberg's Limit Test, Plasticity Index Test, Soil Type Classification, Water Absorption Test, and Compressive Strength Test.

Further investigation with soil blocks of different ratios and compositions concluded that among all the samples CSEB with lime [S2L (20%)] as a replacement of OPC has better water absorption capacity than as a replacement with RHA. Also, CSEB with lime [S2L (20%)] as a replacement for OPC has maximum compressive strength than as a replacement with RHA.

**Keywords:** *binders, compressive strength, permeability, replacement, soil block composition, sustainability*