

ABSTRAK

Penelitian ini mengkaji efektivitas penggunaan cerucuk bambu sebagai metode perkuatan tanah pasir medium pada pondasi dangkal, khususnya di zona pasif dan zona geser radial. Uji laboratorium dilakukan dengan model fisik berskala kecil menggunakan variasi kedalaman cerucuk (5 cm, 10 cm, dan 15 cm) serta jarak antar cerucuk (2,5 cm, 5 cm, dan 7,5 cm). Evaluasi dilakukan berdasarkan nilai daya dukung ultimit (q_{ult}) dan Bearing Capacity Ratio (BCR). Hasil pengujian menunjukkan bahwa peningkatan rasio kedalaman cerucuk terhadap lebar pondasi (z/B) berbanding lurus dengan peningkatan BCR, sedangkan peningkatan rasio jarak antar cerucuk terhadap lebar pondasi (d/B) menunjukkan tren penurunan BCR. Nilai BCR tertinggi sebesar 1,59 tercapai pada kombinasi kedalaman 15 cm dan jarak antar cerucuk 2,5 cm. Koefisien determinasi (R^2) pada analisis regresi mencapai 0,9423–1,0000, yang mengindikasikan hubungan yang sangat kuat antara parameter perkuatan dengan peningkatan daya dukung tanah. Penelitian ini menyimpulkan bahwa konfigurasi kedalaman cerucuk yang lebih dalam serta jarak yang lebih rapat secara signifikan mampu meningkatkan stabilitas pondasi dangkal di atas tanah pasir medium.

Kata Kunci: Cerucuk; Rasio; Pasir; Pondasi; Tanah

ABSTRACT

This study examines the effectiveness of using bamboo cribs as a method of reinforcing medium sand soils in shallow foundations, particularly in the passive zone and radial shear zone. Laboratory tests were carried out with a small-scale physical model using variations in the depth of the cores (5 cm, 10 cm, and 15 cm) and the spacing between cores (2.5 cm, 5 cm, and 7.5 cm). Evaluation was conducted based on the ultimate bearing capacity (q_{ult}) and Bearing Capacity Ratio (BCR) values. The test results showed that an increase in the ratio of the depth of the pile to the foundation width (z/B) was directly proportional to the increase in BCR, while an increase in the ratio of the spacing between the piles to the foundation width (d/B) showed a downward trend in BCR. The highest BCR value of 1.59 was achieved at the combination of 15 cm depth and 2.5 cm spacing. The coefficient of determination (R^2) in the regression analysis reached 0.9423-1.0000, indicating a very strong relationship between the reinforcement parameters and the increase in soil bearing capacity. The study concludes that the configuration of deeper depths and tighter spacing significantly improves the stability of shallow foundations on medium sand soils.

Keywords: Pile; Ratio; Sand; Foundation; Soil