

PERBANDINGAN PENGGUNAAN *FOAMING AGENT* KIMIA DAN *FOAMING AGENT* NABATI TERHADAP KUAT TEKAN MORTAR BUSA

ABSTRAK

Kondisi tanah lunak di Kota Palembang yang memiliki daya dukung rendah menjadi salah satu kendala dalam pembangunan konstruksi jalan, sehingga diperlukan alternatif material ringan untuk mengurangi beban pada tanah dasar. Salah satu alternatif material ringan yang dapat digunakan untuk mengurangi beban terhadap lapisan tanah dasar adalah mortar busa (*foamed mortar*). Mortar busa merupakan campuran semen, agregat halus, air, dan *foaming agent* yang menghasilkan struktur berpori dengan berat isi rendah namun tetap memiliki kekuatan tertentu. Penelitian ini bertujuan untuk membandingkan pengaruh penggunaan *foaming agent* kimia dan *foaming agent* nabati terhadap densitas kering dan kuat tekan mortar busa. Metode penelitian yang digunakan adalah metode eksperimental laboratorium dengan menggunakan variasi campuran *foaming agent* kimia dan nabati pada perbandingan 1:26, 1:28, dan 1:30. Pengujian yang dilakukan meliputi densitas basah, densitas kering, serta kuat tekan bebas (*Unconfined Compression Strength/UCS*) pada umur 3, 7, dan 14 hari menggunakan benda uji silinder berukuran 10×20 cm. Hasil penelitian menunjukkan bahwa jenis *foaming agent* memengaruhi karakteristik mortar busa, dimana penggunaan *foaming agent* nabati menghasilkan nilai kuat tekan yang lebih tinggi dibandingkan *foaming agent* kimia. Nilai kuat tekan meningkat seiring bertambahnya umur perawatan, sedangkan densitas kering cenderung menurun pada campuran dengan kandungan busa lebih tinggi. Berdasarkan hasil penelitian dapat disimpulkan bahwa penggunaan jenis dan variasi perbandingan *foaming agent* memengaruhi karakteristik kuat tekan mortar busa. Mortar busa berpotensi menjadi alternatif material ringan untuk mendukung konstruksi jalan pada tanah lunak.

Kata Kunci: Mortar busa, *foaming agent* kimia, *foaming agent* nabati, densitas kering, kuat tekan.

COMPARISON OF CHEMICAL AND PLANT-BASED FOAMING AGENTS ON THE COMPRESSIVE STRENGTH OF FOAMED MORTAR

ABSTRACT

Soft soil conditions in Palembang City, which are characterized by low bearing capacity, pose challenges to road construction. Therefore, the use of lightweight materials is needed to reduce the load imposed on the subgrade. One alternative lightweight material that can be used for this purpose is foamed mortar. Foamed mortar is a mixture of cement, fine aggregate, water, and a foaming agent that produces a porous structure with low density while maintaining adequate strength. This study aims to compare the effects of chemical and plant-based foaming agents on the dry density and compressive strength of foamed mortar. The research was conducted using a laboratory experimental method with variations in chemical and plant-based foaming agents at ratios of 1:26, 1:28, and 1:30. The tests included wet density, dry density, and unconfined compressive strength (UCS) at curing ages of 3, 7, and 14 days using cylindrical specimens measuring 10×20 cm. The results showed that the type of foaming agent affected the characteristics of foamed mortar, with plant-based foaming agents producing higher compressive strength than chemical foaming agents. The compressive strength increased with increasing curing age, while the dry density tended to decrease as the foam content increased. Based on the results, it can be concluded that the type and variation of the foaming agent ratio affect the compressive strength characteristics of foamed mortar. Foamed mortar has the potential to be used as an alternative lightweight material for road construction on soft soils.

Keywords: Foamed mortar, chemical foaming agent, plant-based foaming agent, dry density, compressive strength.