

## ABSTRAK

**Panuturi Sitompul NIM. 5173250020 : Reutilisasi Limbah Pekerjaan Pengerukan Pada Pelabuhan Belawan Terkontaminasi Logam Berat Dengan Metode Stabilisasi Menggunakan *Bentonite Clay* Pada Pembangunan Jalan Raya. Skripsi. Fakultas Teknik – Universitas Negeri Medan. 2022.**

Pada penelitian ini, sedimen pengerukan dari pelabuhan Belawan direutilisasi sebagai material alternatif pembangunan *subgrade* jalan raya. Sedimen distabilisasi menggunakan *bentonite clay* dengan formulasi campuran 4%, 6%, dan 8%. Pada penelitian ini dilakukan beberapa pengujian untuk mengidentifikasi Karakteristik sedimen, pengaruh penggunaan *bentonite clay*, dan persentase paling optimal. Hasil uji karakteristik (distribusi partikel, *atterberg limit*, dan *proctor*) menunjukkan bahwa sedimen tergolong Pasir SP, bersifat Non-Plastis, Non-Kohesif, dengan Berat Isi Kering  $1,753 \text{ gr/cm}^3$ . Penggunaan *bentonite clay* menghasilkan peningkatan nilai berat isi kering, dengan nilai tertinggi sebesar  $1,849 \text{ gr/cm}^3$  pada campuran 4%. Pada pengujian Kuat Tekan diperoleh peningkatan kuat tekan setelah distabilisasi. Pada pemeraman 33 hari, masing-masing formulasi 4%, 6%, dan 8% mencapai nilai 2,84 MPa, 3,85 Mpa, dan 4,09 MPa. Dan telah memenuhi syarat material stabilisasi untuk pekerjaan *subgrade*, yaitu nilai kuat tekan (UCS) minimum 2 MPa pada 28 hari. Pada pengujian CBR, formulasi 8% meningkatkan nilai CBR sedimen 2 kali lipat, yaitu 9%, yang dapat dikategorikan cukup baik (*fair*), dan nilai Kekuatan *subgrade* tergolong baik (*good*). Pada pengujian TCLP, nilai kandungan 13 parameter dari 17 parameter logam berat dan properti kimia pada sedimen mengalami penurunan dengan penambahan 8% *bentonite clay*.

Kata kunci : stabilisasi, *subgrade*, *bentonite clay*, sedimen pengerukan, logam berat



## ABSTRACT

*Panuturi Sitompul NIM. 5173250020 : Reutilization of Sediment Waste Dredging Works at Belawan Port Contaminated with Heavy Metals with Stabilization Method Using Bentonite Clay in Highway Construction. Thesis. Faculty of Engineering – State University of Medan. 2022.*

*In this research, dredged sediment from Belawan port was reutilized as an alternative material for highway subgrade construction. The sediment was stabilized using bentonite clay with a mixed formulation of 4%, 6%, and 8%. This research was carried out several tests to identify the characteristics of the sediment, the effect of using bentonite clay, and the most optimal percentage. The results of the characteristic test (particle distribution, atterberg limit, and proctor) show that the sediment is classified as SP Sand, Non-Plastic, Non-Cohesive, with a Dry Density Weight of 1,753 gr/cm<sup>3</sup>. The use of bentonite clay resulted in an increase in the dry density value, with the highest value of 1.849 gr/cm<sup>3</sup> at a mixture of 4%. In the Compressive Strength test, an increase in the compressive strength was obtained after being stabilized. At 33 days of curing, the 4%, 6%, and 8% formulations reached 2.84 MPa, 3.85 MPa, and 4.09 MPa. And has met the requirements for stabilizing material for subgrade work, namely the minimum compressive strength (UCS) value of 2 MPa at 28 days. In the CBR test, the 8% formulation increased the CBR value of the sediment by 2 times, namely 9%, which could be categorized as fair, and the value of the strength of the subgrade was classified as good In the TCLP test, the value of the content of 13 parameters from 17 parameters of heavy metals and chemical properties in the sediment decreased with the addition of 8% bentonite clay.*

*Keywords: stabilization, subgrade, bentonite clay, dredged sediment, heavy metal*

