

# SIFAT MEKANIS BETON TAILING PT. FREEPORT INDONESIA, TIMIKA, PAPUA

Hari Bariono Lumbantobing<sup>1</sup>, Andreas Triwiyono<sup>2</sup>, Ashar Saputra<sup>2</sup>

## INTISARI

Kelangkaan dan mahalnya material bangunan konstruksi beton di Kabupaten Merauke belum dapat diatasi, karena tidak memiliki sumber material (*quarry*) lokal seperti: batu, kerikil dan pasir. Ditengah masalah tersebut, diperoleh informasi tentang keunggulan limbah/sisa tambang tailing PT. Freeport Indonesia di Kabupaten Mimika, yang dapat dijadikan sebagai bahan konstruksi beton atau mortar yang dimodifikasi dengan polimer. Deposit limbah tailing yang melimpah keberadaannya sudah membahayakan lingkungan hidup, tetapi secara umum material limbah tersebut layak dipakai sebagai bahan konstruksi pembangunan infrastruktur. Hanya saja belum ada penelitian khusus yang mendalam untuk mengetahui sifat-sifat fisik dan mekanik dari beton dengan bahan agregat tailing.

Penelitian ini dilakukan untuk mengetahui sifa-sifat mekanis mortar beton menggunakan agregat tailing yang dikenal dengan sebutan limbah PT. Freeport Indonesia di Timika, Papua. Pengujian dilakukan dengan menguji benda uji berupa kubus ukuran 70x70x70 mm dan balok ukuran 100x100x500 mm untuk mengetahui kuat tekan, kuat tarik dan modulus elastisitas beton pada umur 28 hari. Variasi campuran yang digunakan dengan perbandingan semen-agregat 1:2, 1:4, 1:6 dan 1:8 ditambah polimer dengan perbandingan 0%, 2,5% dan 5%. Total variasi campuran adalah sebanyak 12 variasi, dengan setiap variasi masing-masing 36 buah kubus yang diuji pada umur 3 hari, 7 hari dan 28 hari dan 36 buah kubus untuk pengujian daya serap air dalam mortar beton yang diuji pada umur 28 hari.

Dari hasil penelitian mortar beton umur 28 hari untuk perbandingan semen-agregat 1:2 dan perbandingan polimer 0%, 2,5% dan 5%, didapat kuat tekan masing-masing adalah 36,697 MPa, 31,503 MPa dan 34,061MPa dan nilai kuat tarik masing-masing 2,83 MPa, 3,18 MPa, 3,28 MPa serta modulus elastisitas masing-masing 22.179,50 MPa, 24.541,00 MPa dan 21.450,67 MPa. Secara umum limbah tailing PT. Freeport Indonesia di Timika, Papua dapat digunakan sebagai bahan konstruksi dengan bahan tambah polimer.

Kata kunci : *Tailing, kuat tekan, kuat tarik dan modulus elastisitas.*

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<sup>1</sup> Dinas Pekerjaan Umum Kab. Merauke Prop. Merauke, Jl. Trikora, Merauke

<sup>2</sup> Jurusan Teknik Sipil dan Lingkungan, FT UGM, Jl. Grafika No. 2 Yogyakarta

## **MECHANICAL CHARACTER OF TAILING CONCRETE PT. FREEPORT INDONESIA, TIMIKA, PAPUA**

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### **ABSTRACT**

*The lack and expensive cost of concrete construction building material in Kabupaten Merauke has not been overcome yet, because it doesn't have local quarry source such as : rock, and sand. Yet there's an information about the advantage of disposal tailing mine of PT. Freeport Indonesia in Kabupaten Mimika, which can be used as concrete construction material or modified mortar with polymer. A large number of tailing disposal in Kabupaten Mimik, specially in Timika Papua, could be an alternative construction material for infrastructure development, and it will be easy because the location of Timika and Papua is relatively closer. Meanwhile the tailing material has been used in Timika as construction material for city development infrastructure such as roads, bridges and houses.*

*This thesis is an advance research to figure out the mechanical character of concrete mortar using the tailing agregat which known as the disposal of PT. Freeport Indonesia that can be used to overcome some problems in Kabupaten Merauke concerning the lack of coarse aggregate and fine aggregate, it happens because the topography and land that full of clay in Kabupaten Merauke is totally different with land in mountain area of Kabupaten Mimika. The test was conducted by testing the cube with dimension 70x70x70 mm and log dimesion 100x100x500 mm to figure out the compressive strength, modulus of rupture and concrete modulus elasticity at the age of 28 days. Mixing variation using cement aggregate comparison 1:2, 1:4, 1:6 and 1: 8 and polymer was added with comparison 0%, 2,5% and 5%. There are 12 mixing variation, each using 36 cube that tested at the age of 3 days, 7 days and 28 days and 36 cube for water absorb in concrete mortar tested at the age of 28 days.*

*The result is concrete mortar age 28 days with cement aggregate comparison 1:2 and polymer comparison 0%, 2,5% and 5%, gain compressive strength 36,697 MPa, 31,503 MPa dan 34,061MPa and modulus of rupture 2,83 MPa, 3,18 MPa, 3,28 MPa and the elasticity modulus 22.179,50 MPa, 24.541,00 MPa dan 21.450,67 Mpa. In general the result is, tailing disposal of PT. Freeport Indonesia in Timika Papua that added with polymer, can be used as concrete construction material, and it is used in design planning and take notice of function and location of the construction, as the research result of mechanical character of tailing concrete has done.*

**Keyword** : Tailing, compressive strength, Modulus of rupture and elasticity modulus.