

RINGKASAN

Keberadaan bidang diskontinu berupa bidang perlapisan pada batuan kerap ditemui. Keberadaan bidang perlapisan ini akan mempengaruhi kekuatan massa batuan. Namun terkadang conto batuan yang diuji di laboratorium umumnya tidak memperhatikan adanya bidang perlapisan yang terbentuk. Oleh karena itu untuk mengetahui pengaruh bidang diskontinu berupa bidang perlapisan perlu dilakukan penelitian di laboratorium.

Penelitian dilakukan untuk mengetahui pengaruh sudut bidang diskotinu pada kuat tekan uniaksial batu *tuff*. Conto penelitian berupa batu *tuff* yang diambil dari Dusun Kedungpring, Desa Bawuran, Kecamatan Pleret, Kabupaten Bantul, Provinsi Daerah Istimewa Yogyakarta. Batu *tuff* memiliki bidang diskontinu berupa bidang perlapisan yang jelas terdefinisi. Bidang perlapisan yang akan dilakukan penelitian memiliki kemiringan 0° (tegak lurus dengan tegangan utamanya), 30° , 60° , dan 90° .

Metode pengujian yang dilakukan dalam penelitian ini meliputi pengujian petrografi, pengujian sifat fisik, pengujian ultrasonik, pengujian kuat tekan uniaksial, dan pengujian kuat tarik tak langsung. Berdasarkan hasil pengujian, nilai kuat tekan uniaksial yang didapatkan pada masing-masing bidang perlapisan adalah $0^\circ = 9,03 \text{ MPa}$, $30^\circ = 7,89 \text{ MPa}$, $60^\circ = 8,39 \text{ MPa}$, dan $90^\circ = 9,10 \text{ MPa}$. Nilai modulus Young (E) dan nisbah Poisson (v) didapatkan dari plot kurva tegangan-regangan. Nilai modulus Young (E) pada masing-masing bidang perlapisan adalah $0^\circ = 2,15 \text{ GPa}$, $30^\circ = 1,67 \text{ GPa}$, $60^\circ = 1,72 \text{ GPa}$, $90^\circ = 2,52 \text{ GPa}$ dan nilai nisbah Poisson (v) pada masing-masing bidang perlapisan adalah $0^\circ = 0,13$, $30^\circ = 0,12$, $60^\circ = 0,25$, dan $90^\circ = 0,14$.

Berdasarkan hasil pengujian, diperoleh nilai maksimum cepat rambat gelombang ultrasonik batu *tuff* pada sudut 90° sebesar $1.937,8 \text{ m/s}$ dan diperoleh nilai minimum pada sudut 30° sebesar $1.814,7 \text{ m/s}$. Berdasarkan hasil pengujian, nilai kuat tekan uniaksial batu *tuff* termasuk batuan yang lunak menurut ISRM (1979) dan termasuk batuan yang sangat lunak menurut Bieniawski (1973) & Tamrock (1988) karena mempunyai nilai kuat tekan uniaksial dibawah 25 MPa . Berdasarkan anisotropik dan nilai kuat tekan uniaksial dari penelitian sebelumnya terlihat adanya pengaruh sudut bidang diskontinu terhadap nilai kuat tekan uniaksial dengan ditunjukkan bahwa kuat tekan minimum berada pada sekitar $\beta = 30^\circ$ dan kuat tekan maksimum berada pada $\beta = 90^\circ$.

ABSTRACT

The existence of discontinuous field bedding plane in the rocks are often encountered. The existence of this bedding plane will affect the strength of the rock mass. But sometimes the rock samples tested in the laboratory is generally don't notice to the bedding plane is formed. Therefore, to determine the effect of bedding plane in the form of discontinuous fields is necessary to do the laboratory research.

The research was conducted to determine the effect dip of discontinuous on tuff's uniaxial compressive strength. The study sample of Tuff taken from Kedungpring Hamlet, Bawuran Village, Pleret District, Bantul Regency, Special Province of Yogyakarta. Tuff has discontinued field a bedding plane is clearly defined. Bedding plane that will do the research to have a slope of 0° (perpendicular to the main stress), 30° , 60° , and 90° .

Methods of testing in this study include petrographic examination, physical properties testing, ultrasonic testing, uniaxial compressive strength testing and indirect tensile strength. Based on test results, uniaxial compressive strength values obtained on each of the bedding plane is $0^\circ = 9,03$ MPa, bedding plane $30^\circ = 7,89$ MPa, $60^\circ = 8,39$ MPa, and $90^\circ = 9,10$ MPa. Value of Young's modulus (E) and Poisson's ratio (v) obtained from the stress-strain curve plot. Value of Young's modulus (E) on each of the bedding plane is $0^\circ = 2,15$ GPa, bedding plane $30^\circ = 1,67$ GPa, $60^\circ = 1,72$ GPa, $90^\circ = 2,52$ GPa and Poisson's ratio value (v) in each of the bedding plane is $0^\circ = 0,13$, $30^\circ = 0,12$, $60^\circ = 0,25$, and bedding plane $90^\circ = 0,14$.

Based on tuff test results, obtained the maximum value of the propagation of ultrasonic waves at an angle $90^\circ = 1.937,8$ m/s and minimum values obtained at an angle $30^\circ = 1.814,7$ m/s. Based on test results, the value of tuff uniaxial compressive strength included soft rock by ISRM (1979) and included a very soft rock, according Bieniawski (1973) and Tamrock (1988) because it has a uniaxial compressive strength values below 25 MPa. Based anisotropic and uniaxial compressive strength value of previous studies have shown the influence of the dip of discontinuous uniaxial compressive strength value to be shown that the minimum compressive strength stands at about $\beta = 30^\circ$ and maximum compressive strength is at $\beta = 90^\circ$.