

INTISARI

Oleh

Rinaldi Maulana Firdaus

Departemen Teknik Geologi, Fakultas Teknik, Universitas Gadjah Mada

Pembimbing : I Gde Budi Indrawan, S.T., M.Eng., Ph.D.

Kondisi geologi Indonesia yang kompleks sehingga menurunkan kualitas massa batuan dan memengaruhi pembangunan infrastruktur. Maka dari itu, perlu adanya berbagai metode rekayasa, salah satunya adalah *grouting*. Pembangunan Terowongan Nanjung melibatkan metode *grouting* yang memengaruhi karakteristik geologi teknik, permeabilitas dan kekuatan massa batuan sehingga perlu tindak lanjut, berletak di Desa Lagadar, Kabupaten Bandung, Provinsi Jawa Barat. Karakteristik geologi teknik yang ditinjau aspek geomorfologi, litologi, struktur geologi, dan hidrogeologi, kualitas massa batuan RMR serta kekuatan dan permeabilitas massa batuan. Metode penelitian dilakukan dengan pemetaan geologi teknik, penentuan kualitas massa batuan RMR melalui batuan inti, uji lugeon, dan uji kuat tekan uniaksial. Karakteristik geologi teknik di sepanjang terowongan Nanjung dari aspek geomorfologi terbagi empat, yaitu satuan perbukitan intrusi zona sesar berlereng terjal, satuan perbukitan zona sesar berlereng sangat terjal, satuan perbukitan berlereng miring, satuan dataran banjir berlereng landai. Aspek struktur geologi adalah sesar geser sinistral dengan arah orientasi NE-SW. Aspek hidrogeologi adalah sungai tipe *gaining stream* dan kedalaman muka air tanah elevasi dengan kisaran 640—665 mdpl dengan arah aliran timur—barat. Aspek geologi terbagi menjadi dua yaitu satuan batupasir tufan dan satuan intrusi dasit, dimana pada kondisi sebelum *grouting* kualitas massa batuan RMR, yaitu *very poor rock* dan *poor rock*, selanjutnya permeabilitas yaitu *high*, *medium*, dan *moderate*, serta kekuatan batuan utuh, yaitu *extremely weak* dan *very weak*. Kondisi setelah *grouting* kualitas massa batuan RMR, yaitu *poor rock* dan *fair rock*, serta kondisi permeabilitas yaitu *medium*, *moderate*, dan *low*, selanjutnya kondisi kekuatan batuan utuh, yaitu *very weak* dan *weak*. Faktor-faktor yang terpengaruh oleh proses *grouting* sehingga merubah kualitas dan sifat massa batuan adalah RQD, kondisi dikontinuitas massa batuan, tingkat pelapukan, nilai lugeon dan konduktivitas hidrolik, kondisi aliran air tanah, dan sifat mekanika batuan.

Kata Kunci : geologi teknik, RMR, permeabilitas, kekuatan batuan, *grouting*

ABSTRACT

By

Rinaldi Maulana Firdaus

*Geological Engineering Department, Faculty of Engineering,
Universitas Gadjah Mada*

Lecture : I Gde Budi Indrawan, S.T., M.Eng., Ph.D.

Indonesia as a complex geological conditions thus reducing the quality of rock mass and affecting infrastructure development. Therefore, needs some various engineering methods, one of which is grouting. The construction of the Nanjung Tunnel involves a grouting method that affects the geological technic characteristics, permeability and rock mass strength who needs to be followed up, located in Lagadar Village, Bandung Regency, West Java Province. Geological technic characteristics involved aspects of geomorphology, lithology, geological structure, and hydrogeology, the quality of the rock mass RMR as well as the rock mass strength and permeability. The research method was carried out by geology technic mapping, determination quality of rock mass RMR from core, lugeon test, and uniaxial compressive strength test. The geological characteristics of engineering along the Nanjung tunnel from the geomorphological aspect are divided into four, namely the intrusive hill hilly terrain zone intrusion unit, the steeply sloped hillside fault unit, the steep sloping hillside unit, the sloping flood plain unit. Aspects of geological structure are sinistral shear faults with NE-SW orientation. Hydrogeological aspects are gaining stream type river and elevation ground water level with a range of 640—655 meters above sea level with east-west flow direction. Geological aspects are divided into two namely tuffaceous sandstone unit and dasit intrusion unit, where in the condition before grouting the quality of the rock mass RMR is very poor rock and poor rock, the permeability class is high, medium, and moderate, then intact rock strength is extremely weak and very weak. The condition after grouting the quality of rock mass RMR is poor rock and fair rock, and the permeability conditions is medium, moderate, and low, then the condition of intact rock strength is very weak and weak. Factors that are affected by the grouting process that change the quality and properties of rock mass are RQD, rock mass continuity conditions, weathering levels, lugeon values and hydraulic conductivity, groundwater flow conditions, and rock mechanical properties.

Keywords : geological technic, RMR, permeability, rock strength, grouting