



## INTISARI

Jalur Pantai Utara (Pantura) yang menghubungkan berbagai kota di pulau Jawa sering menjadi perhatian pemerintah. Hal itu terjadi karena kepadatan lalu lintas yang terjadi setiap tahunnya selalu mengakibatkan kemacetan dan kecelakaan. Demi mengantisipasi hal tersebut, pemerintah melakukan pembangunan jaringan jalan tol di jalur Pantura. Salah satu jalan tol yang dibangun adalah Jalan Tol Pemalang-Batang atau Pemalang-Batang *Toll Road* (PBTR). Jalan tol sepanjang 39,2 km (Sta. 330+000 sampai Sta. 369+196) ini melewati berbagai medan yang menjadi rintangan seperti sungai atau jalan *existing* sehingga diperlukan jembatan untuk melaluinya. Salah satu jembatan yang dibangun adalah Jembatan Serayak dengan bentang 50 m yang melewati sungai Serayak. Jembatan ini didirikan di atas tanah merah yang memiliki lensa pasir. Dari pelaksanaan di lapangan diketahui konstruksi tiang pancang tidak mampu menembus lensa pasir sehingga diperlukan perancangan fondasi berupa tiang bor.

Pada penelitian ini, perancangan fondasi tiang bor dilakukan secara manual. Perancangan dilakukan berdasarkan data lapangan berupa data tanah dan desain struktur yang dijadikan acuan dalam perancangan fondasi tiang bor untuk *abutment* jembatan. Perhitungan pembebanan struktur jembatan didasarkan pada SNI 1725:2016. Perancangan meliputi dimensi tiang bor dan kebutuhan jumlah tulangan yang mampu menahan gaya dan momen yang bekerja terhadap struktur jembatan.

Hasil analisis dan perhitungan diperoleh bahwa tiang bor pada kedalaman 32 m dengan diameter tiang 1,2 m mampu menahan beban yang bekerja terhadap struktur jembatan. Kapasitas dukung tiang yang didapatkan sebesar 2121,496 kN, sehingga diperlukan 24 tiang bor pada setiap *abutment*. Kebutuhan tulangan pada fondasi *abutment* sejumlah 14D32. Desain tulangan tersebut mampu menahan gaya serta momen yang bekerja terhadap struktur jembatan.

**Kata kunci:** Jembatan, fondasi tiang bor, *abutment*.



## ABSTRACT

The North Coast Line, also called Indonesian National Route 1, which connects some cities in Java island attracted government attention. This special concern occurred because its high traffic density rate throughout the year always caused traffic jams and road accidents. To solve the problem, the government has done the construction of toll roads network in the north coast. One of the routes which has been constructed is Pemalang – Batang Toll Road (PBTR). This 39,2 km (Sta. 330+000 to Sta. 369+196) toll road passes through various terrain such as rivers and existing roads, so it is required bridges to pass through. One of the bridges which has been built is Serayak Bridge which is fifty meters long crossing Serayak river. The bridge was constructed on the red soil which has sand lenses. During the execution, it was found that common spun piles couldn't penetrate through the sand lenses so it was needed to redesign the foundation with bored piles.

In this research, the design of bored pile foundation is done manually. The designing was done based on the data consisting of soil data and structural design which were used as references of bored pile design for abutment. Calculation of the bridge structure load was based on SNI 1725:2016. The designing included the dimension of the bored pile and the requirement of reinforcement number which is capable to withstand the forces and moments worked on the bridge structure.

The result of the analysis was found that bored piles in the depth of 28 meters with 1,2 meters in diameter are capable to hold the force worked on the bridge structure. Bearing capacity of one pile is 2121,496 kN, so it is required 24 piles to support each abutment. The requirement of reinforcement in bored piles is 14D32. The design is able to withstand the forces and moments working toward the structure of the bridge.

**Kata kunci:** Bridge, bored pile foundation, abutment.