

**STUDI PERBANDINGAN PONDASI *BORE PILE* DAN TIANG PANCANG
(STUDI KASUS : PROYEK PEMBANGUNAN JEMBATAN SUNGAI
PEDES KABUPATEN BREBES)**

Oleh : Vina Handayani

INTISARI

Proyek pembangunan Jembatan Sungai Pedes Kabupaten Brebes direncanakan menggunakan pondasi *Bore Pile* ukuran 100 cm dan kedalaman 30 m pada abutmen 1 dan 24 m pada abutmen 2. Dalam perencanaan suatu bangunan jembatan tidak lepas dari kriteria aman dan ekonomi. Setiap pondasi dituntut mampu mampu mendukung beban sampai batas keamanan yang telah direncanakan, termasuk mendukung beban maksimum yang terjadi. Analisis dukung pondasi dilakukan dengan memperhatikan data penyelidikan tanah, beban yang dipikul pondasi, dimensi tiang, jarak antar tiang, dan kedalaman tiang.

Peneliti ingin melakukan perencanaan ulang pondasi *Bore Pile* menggunakan pondasi tiang pancang dengan diameter yang lebih kecil untuk mengetahui kekuatan tiang pancang dalam menahan beban struktur di atasnya. Perencanaan ulang tiang pancang menggunakan diameter 0,6 m. Dengan tujuan dari penelitian ini adalah untuk mengetahui perbandingan kapasitas dukung pondasi *Bore Pile* dengan pondasi tiang pancang, efisiensi kelompok tiang dan perbandingan anggaran biaya yang diperlukan dalam proses pelaksanaan. Perhitungan beban diambil dari perhitungan struktur jembatan dengan metode manual.

Hasil analisis kapasitas dukung ultimit (Q_u) pondasi *Bore Pile* menggunakan metode Reese & Wright diperoleh 12434,40 kN pada abutmen 1 dan pada abutmen 2 diperoleh 11680,8 kN. Dengan metode Mayerhof diperoleh 11492,40 kN pada abutmen 1 dan pada abutmen 2 diperoleh 10738,8 kN. Hasil analisis kapasitas dukung ultimit (Q_u) pondasi Tiang Pancang menggunakan metode Reese & Wright diperoleh 13244,52 kN pada abutmen 1 dan pada abutmen 2 diperoleh 105757,64 kN. Dengan metode Mayerhof diperoleh 10895,8 kN pada abutmen 1 dan pada abutmen 2 diperoleh 10757,64 kN. Hasil analisis efisiensi kelompok tiang pada pondasi *Bore Pile* pada abutmen 1 diperoleh nilai Q_g 35179,656 kN dan abutmen 2 nilai Q_g 25419,869 kN, sedangkan daya dukung ijin pondasi Tiang Pancang didapatkan nilai Q_g 16450,548 kN. Hasil analisis menunjukkan bahwa pelaksanaan pondasi *Bore Pile* memerlukan biaya sebesar Rp 2.385.507.334,18 (dua milyar tiga ratus delapan puluh lima juta lima ratus tujuh ribu tiga ratus tiga puluh empat koma delapan belas rupiah), sedangkan pelaksanaan pondasi Tiang Pancang memerlukan biaya sebesar Rp 2.274.483.136 (dua milyar dua ratus tujuh puluh empat juta empat ratus delapan puluh tiga ribu seratus tiga puluh enam rupiah). Sehingga, dari segi biaya pondasi *Bore Pile* dan Tiang Pancang memiliki selisih Rp 111.024.198,09 (seratus sebelas juta dua puluh empat ribu seratus sembilan puluh delapan koma nol sembilan rupiah) atau pondasi Tiang Pancang lebih ekonomis 4,65% dibanding biaya pelaksanaan pondasi *Bore Pile*.

Kata kunci : Pondasi tiang, Kapasitas Dukung, Biaya

**FOUNDATION COMPARISON STUDY OF BORE PILE AND SPUN PILE
(CASE STUDY: THE PROJECT FOR THE CONSTRUCTION OF A BREBES
DISTRICT RIVER BRIDGE)**

By : Vina Handayani

ABSTRACT

The Brebes Regency River Bridge construction project is planned to use the foundation for a bore pile the size of 100 cm and a depth of 30 m at abutmen 1 and 24 m at abutmen 2. In planning a bridge building cannot be separated from safe and economic criteria. Each foundation is required to be able to support the load until the security limits that have been planned, including supporting the maximum load that occurs. The foundation-supporting analysis was carried out by paying attention to soil investigator data, a burden at its foundation, the dimensions of the poles, the distance between the poles, and the depth of the pole.

Researchers want to re-plane the foundation of the piles using the foundation of the piles with smaller diameter to find out the strength of the pileup in holding the structural load of the above. Re-planning of the piling poles using the diameter of 0.6 m. With the aim of this study, it is to determine the capacity of the piling foundation of the preliminary piles, the efficiency of the piles and ratio of the cost budget necessary in the implementation process. Load calculations are taken from the calculation of the bridge structure with manual methods.

The results of the capacity analysis supporting the ultimate (Q_u) foundations of the Bore Pile using the Cheese & Wright method were obtained 12434,40 kNs on abutmen 1 and at abutmen 2 were obtained 11680,8 kN. Using the Mayerhof method, 11492,40 kN on abutmen 1 and at abutmen 2 were obtained 10738.8 kN. The results of the capacity analysis supporting the submission (Q_u) of the foundation of the Spun Pile using the Reese & Wright method were obtained 13244.52 kN on abutmen 1 and on abutmen 2 were obtained by 1057.64 kN. Using the Mayerhof method, 10895,8 kN on abutmen 1 and at abutmen 2 obtained 10757,64 kN. The results of the efficiency of the pile group on the foundation of the Bore Pile on abutmen 1 was obtained the value of Q_g 35179,656 kN and abutmen 2 values of Q_g 25419,869 kN, while the foundation was obtained by the foundation of the Spun Pile was obtained by Q_g 16450,548 kN. The results of the analysis showed that the foundation of Bore Pile needed an expense of Rp 2.385.507.334,18 (two billion three hundred seven thousand three hundred and thirty four point eighteen rupiah), while the implementation of the Spun Pile requires a cost of Rp 2.274.483.136 (two billion two hundred seventy four hundred and eighty three thousand one hundred and thirty six rupiah). Thus, in terms of the foundation fee, the foundation of Bore Pile and Spun Pile has a difference of Rp. 111.024.198,09 (one hundred million twenty-four thousand one hundred and ninety-eight eight rupiah zero rupiah) or the foundation of a Spun Pile of more economical 4.65% compared to the implementation cost of the Bore Pile.

Keywords: *Pile foundation, Bearing Capacity, Cost*