

BAB 5

KESIMPULAN DAN SARAN

5.1 Rangkuman Hasil Penelitian

- Pemodelan numerik tiang tunggal dan kelompok tiang dengan konfigurasi 2x3 spasi 2D menggunakan program PLAXIS 3D 2017 dan Lpile v5.0.46.
- Pelapisan tanah dibagi menjadi tiga lapis dan menggunakan model material *hardening soil* dan tipe aliran *undrained A* pada program PLAXIS.
- Hasil *back analysis* dari program PLAXIS 3D 2017 telah menyerupai hasil pengukuran di lapangan baik itu defleksi, momen, dan gaya geser. Diperoleh estimasi nilai modulus tanah, $E_s \approx 500S_u$ dan nilai $c' \approx 0.1S_u$. Nilai Φ' diperoleh dari grafik Bjerrum dan Simons (1960).
- Dari hasil pemodelan Lpile v5.0.46 diperoleh rentang nilai *P-multiplier* antara 0.6-0.65 sebagai faktor koreksi terhadap reaksi tanah.
- Hasil kurva defleksi terhadap beban yang diperoleh dari Lpile menyerupai kurva yang diperoleh dari hasil pengukuran.
- Efisiensi baris paling belakang (*trailing row*) pada suatu kelompok tiang memiliki tahanan lateral yang terbesar diantara tiang lainnya. Karena meskipun terdapat *overlapping shear zone* yang besar namun terdapat

kombinasi kekakuan antara tanah dan tiang di depannya. Rentang rasio efisiensi berkisar antara 0.9 (*leading row*) hingga 1.05 (*trailing row*).

- Efisiensi kelompok tiang dibandingkan dengan tiang tunggal memiliki nilai diatas 1 (1.01-1.1) untuk beban diatas 18 ton dan dibawah 1 (0.8-0.99) untuk beban dibawah 18 ton. Secara empirik, efisiensi kelompok tiang dibandingkan dengan tiang tunggal dapat dikatakan mendekati 1.
- Meskipun rasio nilai efisiensi yang diperoleh dari penelitian ini dapat berbeda pada kondisi tiang dan tanah yang berbeda, namun perilaku antar baris dan kapasitas kelompok tiang terhadap tiang tunggal memiliki perilaku yang kurang lebih sama.

5.2 Saran

- Pada penelitian ini, tiang tidak dilengkapi dengan instrumentasi *load cell* sehingga estimasi proporsi beban yang diperoleh tidak dapat diverifikasi secara langsung.

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