

## Analisis timbunan bertiang di atas tanah lunak dengan sistem friction piles: permodelan numerik 3D = Piled embankment analysis over soft soil with friction piles 3D numerical modeling / Ahmad Syihan

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### Abstrak

[<b>ABSTRAK</b><br>

Timbunan bertiang merupakan salah satu metode dalam meningkatkan daya dukung tanah lunak ketika dilakukan pekerjaan penimbunan, dimana tanah dasar diberikan perkuatan berupa pondasi tiang. Adapun dengan adanya perkuatan pada tanah lunak ini ternyata dapat mengurangi penurunan yang terjadi. Hal ini disebabkan oleh adanya mekanisme arching effect yang menyebabkan sebagian beban timbunan ditransfer ke pondasi tiang, sehingga tanah lunak mengalami reduksi beban. Penelitian ini merupakan turunan dari penelitian timbunan bertiang, dimana pada penelitian ini akan dianalisis perbedaan antara pondasi tiang yang menggunakan gesekan antara pondasi tiang dan tanah (friction piles) dengan pondasi tiang dengan menggunakan tahanan ujung (end bearing piles), dimana digunakan Program Plaxis 3D Foundation dalam permodelannya. Selain itu, studi ini juga memvariasikan ketinggian timbunan, jarak antar tiang, kekakuan aksial lapisan geosintetik, dan juga susunan pondasi tiang sehingga dapat terlihat pengaruhnya terhadap sistem timbunan bertiang ini. Bahasan dalam penelitian ini mencakup penurunan dan juga perilaku konsentrasi tegangan yang terjadi pada timbunan bertiang, serta pengaruhnya terhadap gaya tarik geosintetik yang terjadi pada pondasi tiang.

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<b>ABSTRACT</b><br>

Piled embankment is one of the methods to improve soft soil's bearing capacity when the embankment construction is done, in which the base soil is given piles as the support. With piles support the soft soil, the settlement of the embankment can be reduced. This is because of the arching effect mechanism which causes some of the loads of the embankment are transferred through the piles, so that the load working on soft soil is reduced. This study is a derivative of piled embankment case study, where this study will analyze the differences of behaviour between the friction piles system and end bearing piles system using Plaxis 3D Foundation for modeling the case. Besides that, this study is also varying the height of embankment, the spacing between piles, the axial stiffness of geosynthetic layer, and the arrangement of piles so that the affection against piled embankment system could be concluded. The discussion of this research concludes the settlements and also the stress concentration behaviour, and also the axial force of geosynthetic layer that occurs in the piled embankment system.;Piled embankment is one of the methods to improve soft soil's bearing capacity when the embankment construction is done, in which the base soil is given piles as the support. With piles support the soft soil, the settlement of the embankment can be reduced. This is because of the arching effect mechanism which causes some of the loads of the embankment are transferred through the piles, so that the load working on soft soil is reduced. This study is a derivative of piled embankment case study, where this study will analyze the differences of behaviour between the friction piles system and end bearing piles system using Plaxis 3D Foundation for modeling the case. Besides that, this study is also varying the height of embankment, the spacing between piles, the axial stiffness of geosynthetic layer, and

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