https://doi.org/10.1016/j.sandf.2024.101426

Effect of pile arrangement on long-term settlement and load distribution in piled raft foundation models supported by jacked-in piles in saturated clay Lua Thi Hoang, Xi Xiong, Tatsunori Matsumoto

Piled raft foundation (PRF) design on clay, time-dependent behavior of the foundation is important. ↔ little attention has been paid. This study presents the long-term behaviors of PRF with different pile arrangement schemes.

Load Sharing:
Small loads → piles majorly supported the load and suppressed foundation settlement.
Large loads → raft took on a load-bearing role.

Settlement during Load Increments:
Considering consolidation settlements in PRF design on saturated clay is important.

Load Sharing:
The applied load level affected load sharing between the raft and piles and between individual piles.
Corner piles bore larger loads at smaller load levels but lesser at higher loads compared to center piles.

Impact on Ground Strength:
After loading, ground strength beneath the raft center increased more than beneath the raft edge.

They show quantifications for obvious results.
Quantification of obvious results, but presenting considerations
Highlights the complex interplay between pile arrangement, load levels, and soil properties in the behavior of piled raft foundations on saturated clay.

Soils and Foundations 64 (2024) 101427 https://doi.org/10.1016/j.sandf.2024.101427
Microstructural insight into the hysteretic water retention behavior of intact Mile expansive clay
Gao-feng Pan, Yi-xuan Zheng, Sheng-yang Yuan, Dan-xi Sun, Olivier Buzzi, Guan-lu Jiang, Xian-feng Liu

Outline

"Water retention behavior of clayey soils" refers to how clayey soils absorb, hold, and release water.

→ **strong volume change** during **drying-wetting cycles**

→ essential to understand the hydro-mechanical behavior of expansive soils.

→ soil water retention curve along the wetting–drying path of intact clay

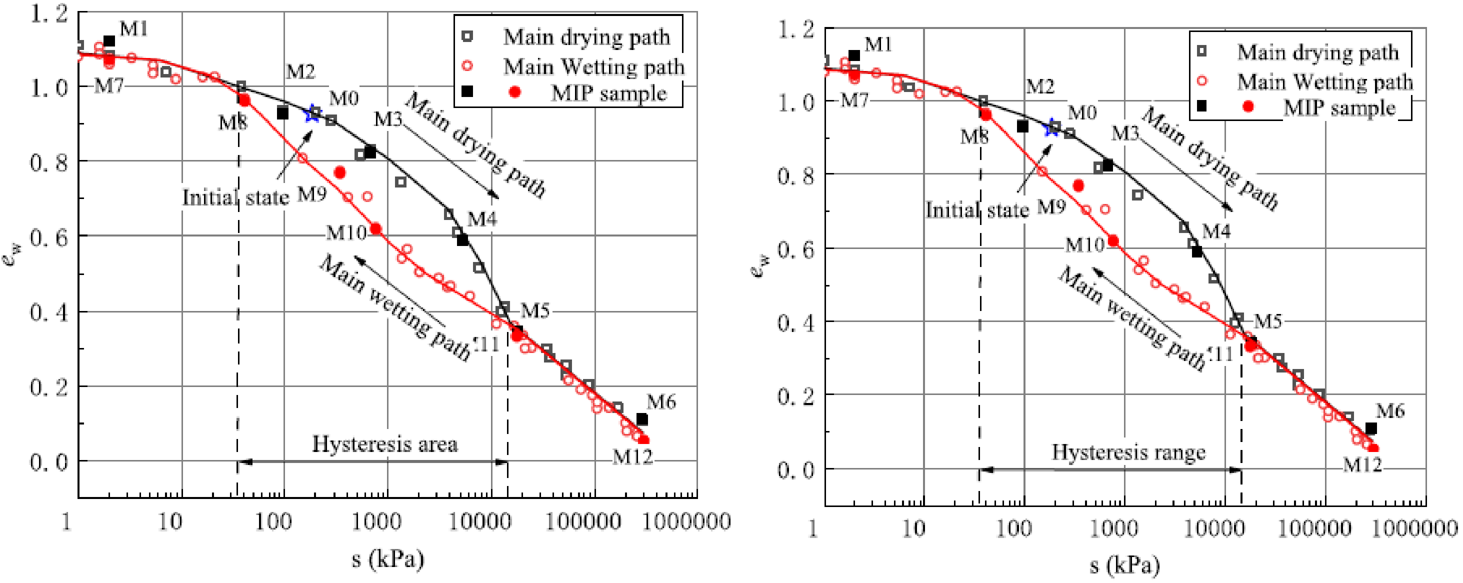


Fig. 8. Soil water retention curve of intact Mile clay.

Water retention behavior of clay hysteretic by different contact angle by wet/dry/entrapped air.

(in this paper) Microstructure change effect on the water retention hysteretic phenomenon.

For expansive soils, along the wetting and drying path -> microstructure change.

Evolution of microstructure along wet/dry path characterized by mercury intrusion porosimetry test.

Soils and Foundations 64 (2024) 101438 https://doi.org/10.1016/j.sandf.2024.101438
Triaxial testing response of compacted iron ore tailings considering a broad spectrum of confining pressures
Joao Paulo Sousa Silva, Ana Luisa Cezar Rissoli, Pedro Pazzoto Cacciari, Anto´nio Joaquim Pereira Viana da Fonseca, Hugo Carlos Scheuermann Filho, Alexia Cindy Wagner, Joao Vı´tor de Azambuja Carvalho, Lucas Festugato, Nilo Cesar Consoli

(Outline)
Through triaxial test with high confining stress on filtered tailings disposal.
Understanding of the denser and dewatered material response over a broad range of confining pressures is essential to design tall dry stacking tailings. Based on the influence of the initial density due to compaction.

(Results)
The results indicated the existence of a curvilinear critical state line in the v:log p´ plane.
Small particle breakage - reduction in surface roughness, breakage of asperities, and reduction in particle angularity.
Static liquefaction was observed amongst the loosest specimens sheared under the lowest confining levels.

A study that took this into account as there are cases of high pressure.
When efficient and economical tailings iron ore method is applied, it provides an important indicator for stability evaluation.

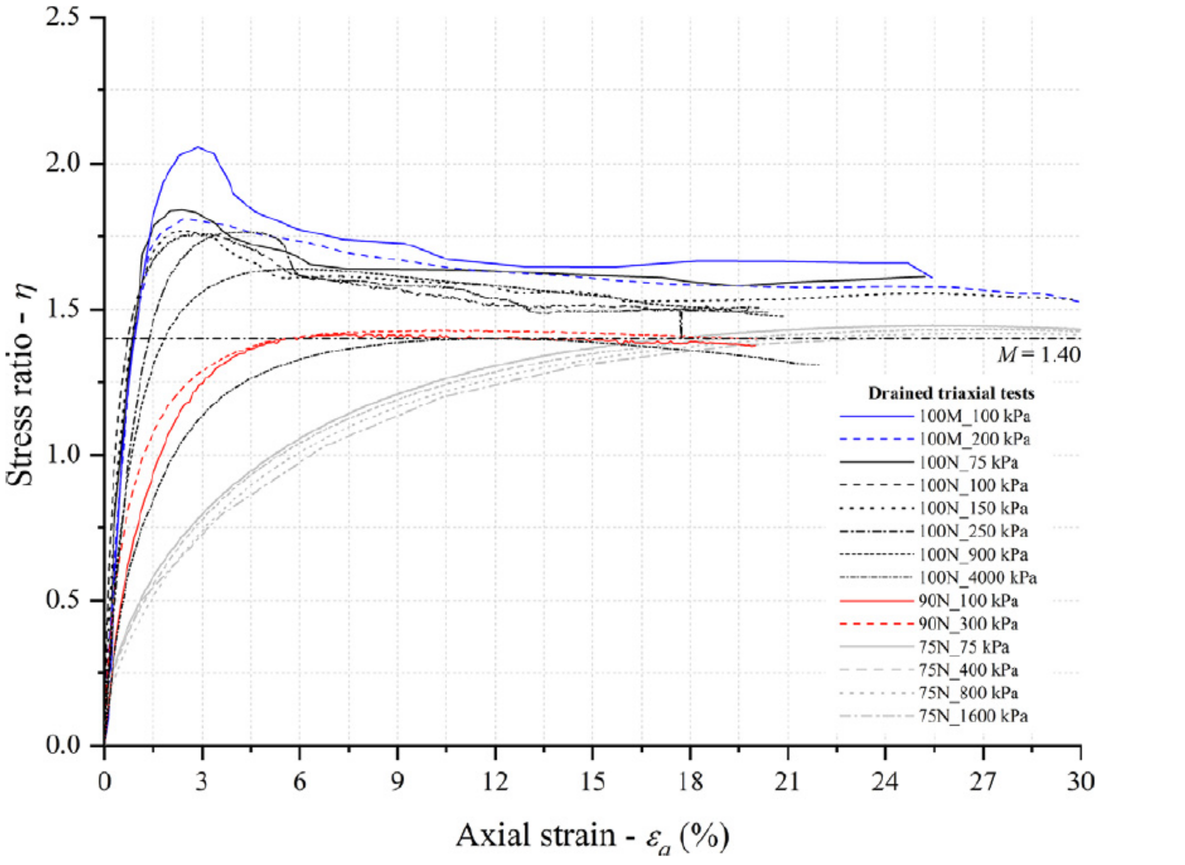


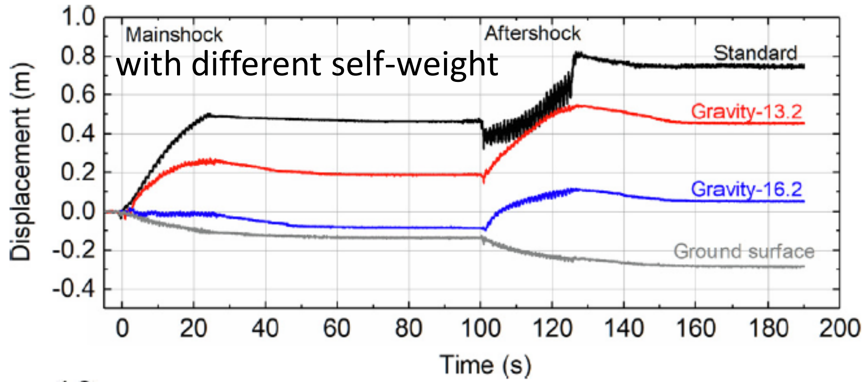
Fig. 7. Normalized stress–strain response (a) CID tests (b) CIU and CKU tests.

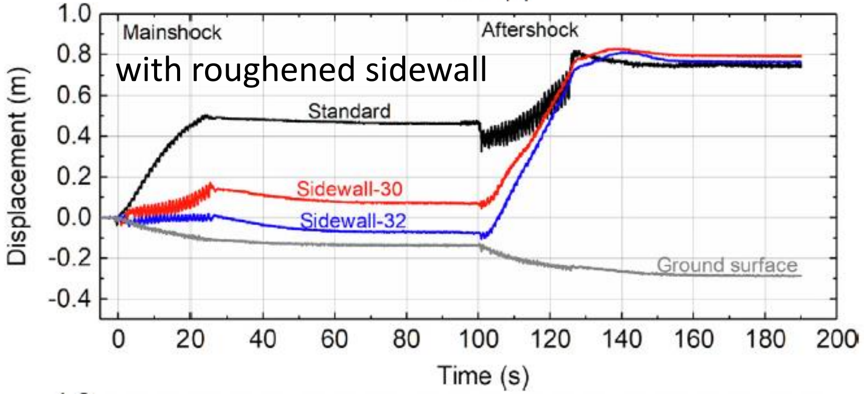
Soils and Foundations 64 (2024) 101439 https://doi.org/10.1016/j.sandf.2024.101439

Robustness of remediation measures against liquefaction induced manhole uplift under mainshock-aftershock sequence

Zhiyong Zhang, Siau Chen Chian

This paper studies the uplift behavior of a conventional manhole subjected to the **mainshock-aftershock sequence** through centrifugal tests.
liquefied during the mainshock, manholes become more vulnerable when faced with aftershocks.
[Increasing the self-weight, roughening the sidewalls]



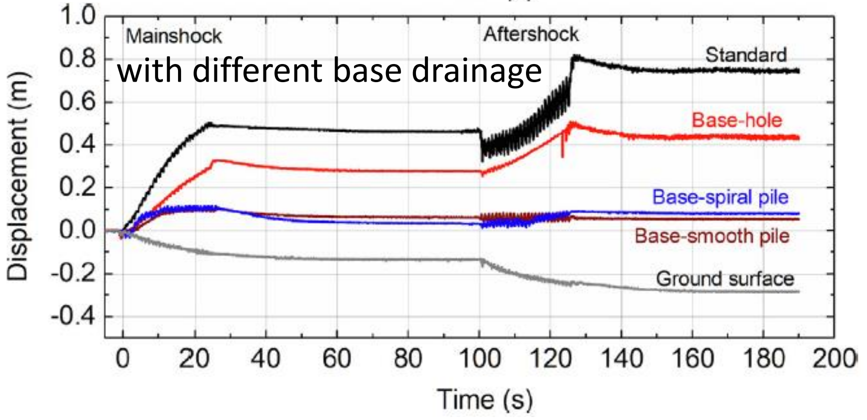


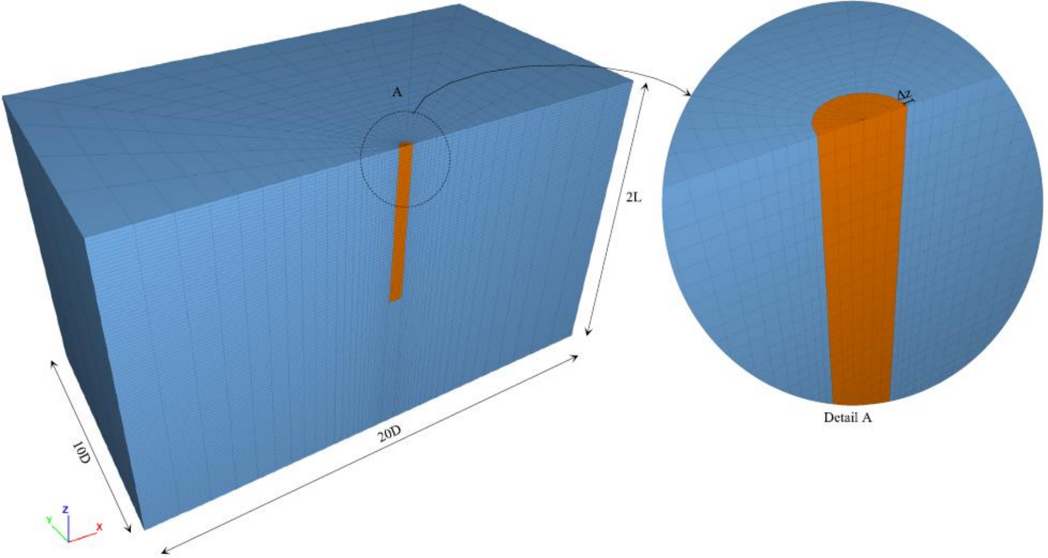
Mainshock cause a rise in groundwater table and ground settlement. Such changes would put manholes, which survived the mainshock, more vulnerable when facing subsequent aftershocks due to the increase in buoyancy and decrease in sidewall friction above the groundwater table.

Disturbance of soil -> lessen the effect of roughed sidewall

Increased water level -> lessen the effect of weight

In contrast, the methods that mitigates manhole uplift by enhancing the manhole's base permeability with pipe -> performance in the aftershock than in the mainshock.





[Outline]
Previous studies on pile-soil, p-y curve were limited by not considering the actual nonlinear behavior of soil.

Constitutive model: HS-Small model (double stiffness model, including plastic hardening model, potential function for flow rule)
Stiffness Parameters: E_0 for very small strain modulus, E_{ur} for unloading-reloading modulus, and E_{50} for secant modulus corresponding to 50% of the ultimate strength.

Results: obtaining p-y curves numerically at certain depths for comparison with reference studies.

Pile Diameter (D): D↑ - greater ultimate soil resistance and required more soil displacements to mobilize this resistance.
[increased nonlinearity with larger diameters]
Slenderness ratio (L/D): ultimate soil resistance in slender piles (L/D = 12) with small diameters is about 10% lower than non-slender piles (L/D = 6). However, for large-diameter piles (D = 3 m), the p-y curves remain identical regardless of slenderness.

Relative Density (Dr): With increasing Dr, increase in ultimate soil resistance (pu).
Soil Nonlinearity (E0/E50): As nonlinearity increases, larger displacements are required to mobilize ultimate soil resistance.

The proposed model includes the initial pile-soil stiffness (Kpy), ultimate lateral resistance (pu), and nonlinearity parameters (b and s). The model is shown to be more accurate in large displacement ranges compared to small ones.

Soils and Foundations 64 (2024) 101442 https://doi.org/10.1016/j.sandf.2024.101442
Seepage analysis model based on field measurement data for estimation of posterior parameter distribution using merging particle filter
Shinichi Ito, Kazuhiro Oda, Keigo Koizumi

Outline
Discusses the applicability of the merging particle filter (MPF) method for estimating the posterior distribution of seepage analysis models based on the volumetric water content field measurement data.

For landslide risk assessment. For parameter estimation of natural ground that is difficult due to inhomogeneity and uncertainty.

With two cases study – 1) Data assimilation of parameters for unsaturated soil hydraulic properties, 2) Data assimilation of seepage analysis model including boundary conditions

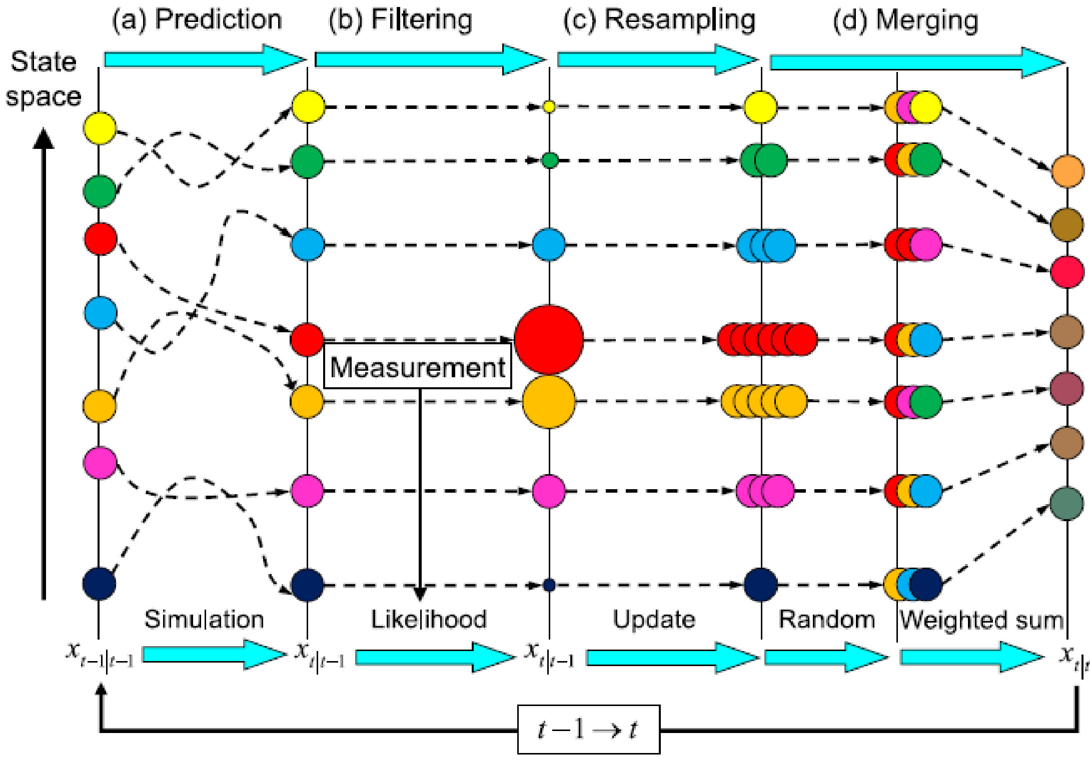


Fig. 2. Computational procedure for MPF.

Conclusions
Through above, risk assessment was well match.
This study is significant in ~
Used field measurement data.
Combines field measurement and numerical analysis.
Overcome existing limitations (PF) through the application of MPF.
Makes it possible to predict actual failure rather than just estimate parameters.

식 (3), 식 (4)가 같네, where is ks?

Liquefaction characteristics of sand-gravel mixtures: Experimental observations and its assessment based on intergranular state concept
https://doi.org/10.1016/j.sandf.2024.101444
Abilash Pokhrel, Gabriele Chiaro, Takashi Kiyota, Misko Cubrinovski

Outline

Cases of liquefaction in gravel ground have been reported during major earthquakes.

➔ It is known that liquefaction does not occur in gravel, but actual gravel ground may be vulnerable to liquefaction due to mixing with sand and fines.

Liquefaction characteristics of Sand-gravel mixtures (SGM) based on the gravel content (GC), relative density (Dr),

GC & Dr ∝ Liquefaction resistance

Different particle grading characteristics of SGM significantly affect CRR

GC and Dr are not considered independently but are seen as a combined effect.

~equivalent void ratio/relative density are shown to be critical factor.

It is necessary to make a plan to utilize this in your own research through an additional understanding process.

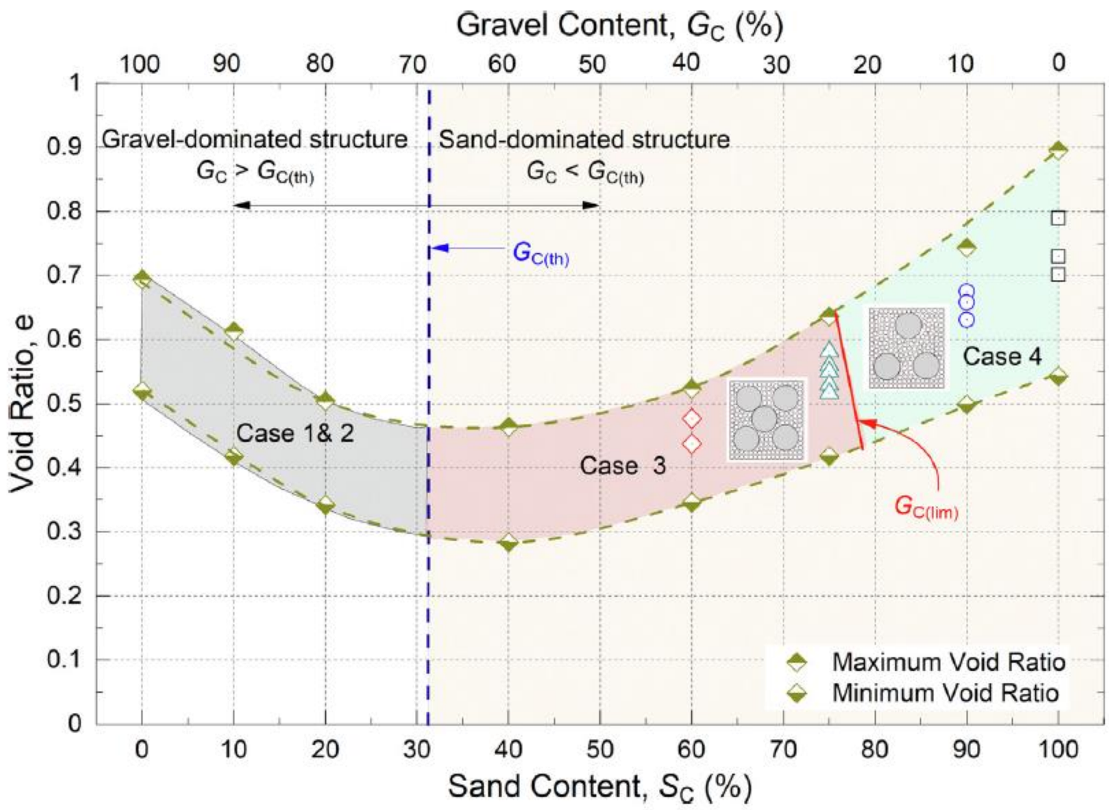


Fig. 5. Diagram of microstructures attained in this study for SGM.