

# Experimental study on interface properties between crushable soils and pile materials

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# 1998 Fiscal Year Final Research Report Summary

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## Experimental study on interface properties between crushable soils and pile materials

Research Project

### Project/Area Number

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09650543

### Research Category

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Grant-in-Aid for Scientific Research (C)

### Allocation Type

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Single-year Grants

### Section

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一般

### Research Field

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Geotechnical engineering

### Research Institution

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Kanazawa University

### Principal Investigator

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### Project Period (FY)

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1997 – 1998

### Keywords

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Friction / Cruashability / Pile / Soft rock / Shirasu sand / Diatomaceous mudstone / Direct shear test

## Research Abstract

Direct shear tests between soils and steel materials were conducted in this research to investigate influential factors on coefficient of friction. Diatomaceous mudstone known as a soft rock, and Shirasu sand that is a typical crushable soil were used as soil specimen. Steel plates having different surface roughness, Rmax, of 10, 30, 40gm, were prepared as pile materials. Other experimental parameters were normal pressure, cm, shear displacement rates of 2mm/mm and 20mm/mm, and number of repeated loading.

Principal findings from this research are as follows :

- 1)The shear strength at the pile-soil interface is dominated by Mohr-Coulomb criterion where shear strength is proportional to effective normal stress  $\sigma_n$ .
- 2)Coefficient of friction  $m$  is increased with number of repeated loading toward internal coefficient of friction of soil.
- 3)This phenomenon is associated with crush of soil particles. It is presumed that finer soil particles produced by particle crush bury ditches on the pile surface so that pile-soil slip mode changes to soil-soil slip mode as crush of soil particles is progressed.

## Research Products (8 results)

		All	Other
		All	Publications (8 results)
[Publications]	松本 樹典 他: "Correlation between ultimate pile skin friction and CPT data" Proc.1st Int. Conf. Site Characterization. 1177-1182 (1998)		▼
[Publications]	松本 樹典 他: "Direct shear tests between diatomaceous mudstone and fiction sleeve materials with different surface roughness" Proc.1st Int. Conf. Site Characterization. 1105-1111 (1998)		▼
[Publications]	松本 樹典 他: "珪藻泥岩地盤における打込み鋼管杭の施工と波動理論に基づく荷重～変位関係" 土木学会論文集. No.610/III-45. 1-18 (1998)		▼
[Publications]	松本 樹典 他: "しらすと鋼材の摩擦係数に及ぼす粒子破碎の影響" 破碎性土の工学的諸問題に関するシンポジウム論文集. 印刷中. (1999)		▼
[Publications]	Takesue, K., Matsumoto, T.and Sasao, H.: "Correlation between ultimate pile skin friction and CPT data" Proc.1st.Int.Conf.on Site Characterization, ISC'98, Atlanta, Georgia, USA. 1177-1182 (1998)		▼
[Publications]	Matsumoto, T., Takesue, K., Sasao, H,and Igarashi, T.: "Direct shear tests between diatomaceous mudstone and friction sleeve materials with different surface roughness" Proc.1st Int.Conf.on Site Characterization, ISC'98, Atlanta, Georgia, USA. 1105-1111 (1998)		▼
[Publications]	Matsumoto, T., Hayashi, M., Michi, Y., Takesue, K.and Futatsuka, Y.: "Construction of open-ended steel pipe piles in diatomaceous mudstone and prediction of load-displacement relations by dynamic load testing (in Japanese)" Jour.of Geotechnical Eng., Japan Society of Civil Engineers. No.610/III-45. 1-18 (1998)		▼
[Publications]	Matsumoto, T., Miyaji, S., Katamura, R., Takesue, K.and Sasao, H.: "Influence of particle crush on the friction coefficient between Shirasu soil and steel materials (in Japanese)" Proc.Symp.on Engineering Problems in Crushable Soils, Japanese Geotechnical Society. (in printing). (1999)		▼

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