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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Slake Durability of The Compacted-Siltstone Fragment With Cement Stabilization		
Jumlah Penulis	:	3 orang (Edi Hartono, **Sri Prabandiyani Retno Wardani**, Agus Setyo Muntohar)		
Status Pengusul	:	penulis ke-2		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	International Journal of GEOMATE
		b. Nomor ISSN	:	2186-2982 (Print), 2186-2990 (Online)
		c. Vol, No., Bln Thn	:	Vol.17, Issue 64, December 2019, pp. 123- 130
		d. Penerbit	:	The Geomate International Society, Japan
		e. DOI artikel (jika ada)	:	https://doi.org/10.21660/2019.64.84678
		f. Alamat web jurnal	:	https://www.geomatejournal.com/node/1652
		Alamat Artikel	:	https://www.geomatejournal.com/sites/default/files/articles/123-130-84678-Hartono-Dec-2019-64g.pdf
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Semarang,

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Prof. Dr. Ir. Suripin, M.Eng.
NIP. 196004271987031001
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Reviewer II

Prof. Ir. M. Agung Wibowo, MM, M.Sc, Ph.D
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Semarang, 02 Juli 2020
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Unit kerja : Departemen Teknik Sipil FT UNDIP

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   The physical change due to slaking, slake durability index
   Paper - paper pd journal terdahulu banyak dipakai utk membahas.
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International Journal of GEOMATE
Volume 17, Issue 64, 1 December 2019, Pages 123-130

Slake durability of the compacted-siltstone fragment with cement stabilization (Article) (Open Access)

Hartono, E.[a,b], Wardani, S.P.R.[a], Muntohar, A.S.[b]

Save all to author list

[a]Department of Civil Engineering, Faculty of Engineering, Diponegoro University, Indonesia
[b]Department of Civil Engineering, Universitas Muhammadiyah Yogyakarta, Indonesia

Abstract

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Cement stabilization is a practical improvement method of the soil bearing capacity of problematic soils. Soil bearing capacity is attributed to its strength and durability . The decrease in durability can be caused by weathering. On this account, to improve the long-term behavior of soil experiencing weathering process, it is necessary to apply cement stabilization to ensure the quality of road performance. This paper presents the results of a laboratory investigation on slaking index and the physical change of cement - stabilized soil. A new sample preparation method of stabilized soil is presented in this study for the slake - durability test. The cement content was varied from 2 to 10 percent of the dry soil. The test results show that the unstabilized compacted-siltstone was ruined on the first test cycle. In general, the degree of slaking (Is) increases with the slaking cycle but decreases with the cement content. Whereas, the slaking durability index (Id(2)) increases as cement content increases. A large quantity of cement was required to obtain a successful stabilization . This study recommends that 7% of cement is suitable for soil modification, while 10% of cement satisfies the requirement for stabilization . © 2019 Int. J. of GEOMATE.

SciVal Topic Prominence

Topic: Slaking | Mudstone | Flysch

Prominence percentile: 66.084

Author keywords

Cement stabilization | Compacted-siltstone | Degree of slaking | Slake - durability index | Slaking cycle

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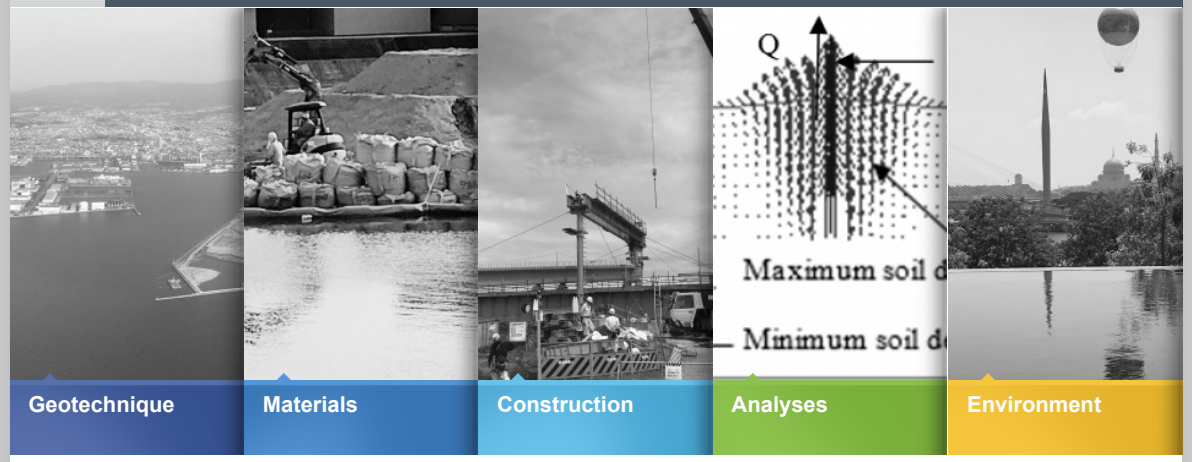

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ENHANCEMENT OF BEARING CAPACITY OF SOFT SOIL USING GEOSYNTHETICS

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ABSTRACT: In many situations, conventional foundation systems could not be chosen in soft soil due to the low bearing capacity. In such a case, ground improvement or reinforcing of the ground is necessary to obtain the required bearing capacity. This paper deals with the use of geosynthetics to reinforce the ground for reducing ground deformation and increasing bearing capacity of the ground. This research is mainly focused on the soft clay soil which is more problematic than the sandy soils with respect to the building foundation of infrastructures. Here, numerical analysis has been carried out with the finite element method, using the elastoplastic sub loading t_{ij} model. Bearing capacities for different over consolidation ratios (OCRs)and changing the depth of the reinforcement are compared. Bearing capacity is also checked replacing the soft clay with granular soil in between the foundation and reinforcement. It is found that reinforcement increases the bearing capacity of the soft clay and the increment of the bearing capacity depends on the depth of the reinforcement, OCR and improved area of the ground underneath the foundation.

Keywords: Bearing Capacity, Geosynthetics, Finite Element Method, Soft Clay

1. INTRODUCTION

The vast areas of Bangladesh are composed of very soft to soft fine-grained soil materials of recent origin. Subsoil's of South-West coastal districts consist of fine-grained soil deposits predominantly with peat and muck. As the soil is composed of organic substances, it is soft and compressible. Thus soil exhibits huge total, and differential settlement and engineers are facing difficulties in addressing the issue of geotechnical engineering-related problems such as bearing capacity failure and slope stability. The general foundation system is not suitable in this kind of soft soil due to environmental constraints and because of their expensive and time-consuming nature. For the construction in very soft soil, excavation and replacement was a common method in the past. But this is expensive and not always practical. This research focuses on using geosynthetics to reinforce the ground for increasing6 the bearing capacity and reducing ground deformation. In recent years, many researchers used base reinforcement technique as a solution to increase the bearing capacity of soft ground using the tensile strength of the reinforcement ([1], [2], [3], [4], [5], [6], and [7]. Reinforcement can withstand tensile forces acting upon the soils from the upper surcharge.

The benefit of geosynthetics reinforcement for ground improvement has been confirmed in field-scale experiments on square footings [8]. It was found that a significant increase in bearing capacity can be achieved by using geosynthetics in the foundation systems at the academic and residential buildings constructed at Khulna Medical College [9], which is located at the South-West region of Bangladesh. In the same region, at Khulna University, the foundation for the four-story academic building-I was constructed over mat by replacing top soft ground and peat layer whereas academic building-II was constructed on floating foundation resulting in settlement of 700 mm and 19 mm, respectively [10].It was found that fixed edges of the reinforcing members with the ground are more effective than that of the free edges of the reinforcement [7] which was also proven during a tremor of the Great East Japan Earthquake on March 11, 2011.

In this study, numerical analyses were performed with the finite element program FEMtij-2D using the elastoplastic sub loading t_{ij} model ([11] and [12]). The validity of the model has already been verified in previous research ([6] and [7]). This model can describe the typical stress deformation and strength characteristics of soils, such as the influence of the intermediate principal stress, stress path dependency of plastic flow and the density and/or confining pressure.

2. OUTLINE OF NUMERICAL ANALYSES AND TEST PATTERNS

Two-dimensional finite element analyses are carried out with FEMtij-2D program which is

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BEHAVIOR OF GEOGRID-PILE FOUNDATION SYSTEM IN LOOSE SANDY SOILS UNDER HALABJAH EARTHQUAKE

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ABSTRACT: Due to the increase in seismic activity in Iraq recently and the need to reduce the damage to the foundations, this research has been carried out in order to study the response of the pile foundation reinforced by geogrid in loose sandy soils. Because of the paucity of information linking the pile foundations with geogrid, the geogrid used in this research to reinforce the loose sandy soil under earthquake loading. Three types of geogrid are used in loose sand under the influence of the largest wave of earthquakes hit the regions of Iraq zones known Halabjah earthquake. Results predict the impact of treatment on the piles, and to study the settlement, horizontal displacements and bending moment of the piles, as well as the accelerations and pore water pressure of the soil. It was concluded that adding geogrid to the pile foundation would be reduced settlement, horizontal displacement, tip load and bending moment of the pile.

Keywords: Acceleration, Bending moment, Earthquake, Geogrid, Loose sand, Pile, Shaking table, Strain gauge.

1. INTRODUCTION

There was a need to find solutions to eliminate the damage of earthquakes on the deep foundations under dynamic effects Taha [1] and Zanzinger et al. [2], which has used the geogrid mesh with the pile foundation in the soft soil to reduce the settlement or enhance the lateral performance of piles under the effect of dynamic loads. Because of the lack of researches that uses the real waves with sandy soils for study such subject, Halabjah earthquake is one of the strong earthquakes that hit Iraq regions in 2017 that used in the experimental work. The experimental part includes constructing laboratory models, which include spread the geogrid inside the loose sandy soil and connect it with the piles using special connections designed for this purpose (rings). 18 tests were performed using shaking table manufactured by Al-Tameemi [3] and Al-Sammaraey [4]. In the current research, the geogrids used are Tensar SS2, Netlon CE121, and SQ12. 7 tests carried on single pile in dry sandy soil, 3 tests are performed on single pile in saturated sand and 8 tests of 2 and 4 piles in dry sand.

2. MATERIAL AND INSTRUMENTS USED

2.1 The Sand Used

The curve of the particle size distribution for backfill material is shown in Fig.1. The soil is classified as poorly graded sand (SP) according to the Unified Soil Classification System USCS the tests for physical and chemical properties of sand were carried out under standard specifications of ASTM and BS respectively. The physical and chemical properties of sand used were listed in Table 1.

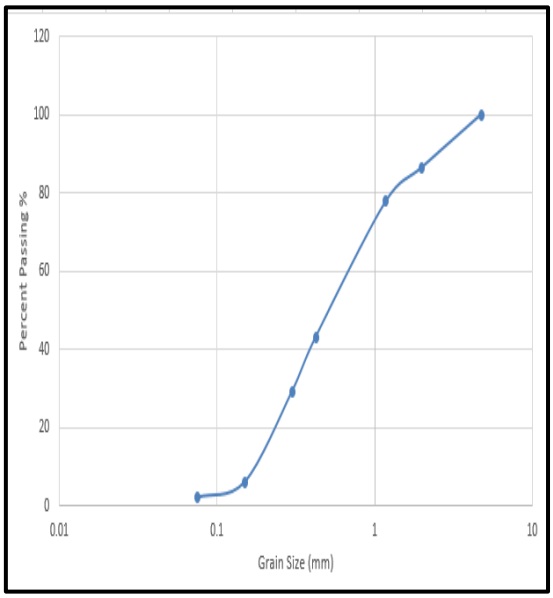

Fig.1. The particle size distribution

2.2 The Geogrid Reinforcement

Three types of geogrid are used, Tensar SS2, Nelton CE121 and SQ12 geogrids. The physical properties of geogrid used in this study listed in Table2 according to Fakhraldin [5]. The geogrid spread within the sand soil layer with dimensions 200×200 mm and 700×700 mm at the depth equal to L/8 (where L is the embedded pile length). The geogrid mesh connected to model piles by the rings, that is made of polytetrafluoroethylene (PTFE) which known as