# SHEAR BEHAVIOR OF RICE HUSK ASH – CEMENT KILN DUST STABILIZED CLAY

Final Project Report

as a requirement to obtain Bachelor degree from

Universitas Atma Jaya Yogyakarta

by:

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DEPARTMENT OF CIVIL ENGINEERING
FACULTY OF ENGINEERING
UNIVERSITAS ATMA JAYA YOGYAKARTA
YOGYAKARTA
2018

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I signed below stating that the final project with the title:

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It is the result of my own work and not a result of plagiarism of other people's work. Ideas, research data, and quotes directly or non-directly derived from the writings or ideas of others expressly provided in this Final Project. If it is proven later that this Final Project is the result of plagiarism, the graduation certificate that I received will be canceled and returned to Universitas Atma Jaya Yogyakarta.

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Who made the remarks,


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## APPROVAL

Final Project Report

# SHEAR BEHAVIOR OF RICE HUSK ASH – CEMENT KILN DUST STABILIZED CLAY

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Student ID Number: 141315719

has been approved by Superivsor

Yogyakarta, April 23 2018

Supervisor,

Ir. J. Tri Hatmoko, M.Sc.

Department of Civil Engineering

Chairman,

Ir. A. Y. Harijanto Setiawan, M.Eng., P.hD.

**APPROVAL**

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Has been examined and approved by:

| | Name | Signature | Date |
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| Chief | : Ir. J. Tri Hatmoko, M.Sc. | | MARCH 23, 2018 |
| Secretary | : Dr.Eng. Luky Handoko, S.T., M.Eng. | | APRIL, 23rd 2018 |
| Member | : Dr. Ir. Junaedi Utomo, M.Eng. | | April 24, 2018 |

## ACKNOWLEDGEMENT

I would like to express my gratitude towards the three jewels, Buddha, Dhamma, and Sangha, which along the way always guide the author from the beginning up to the end in preparing this final project report. This report was completed as a requirement to obtain Bachelor degree from Universitas Atma Jaya Yogyakarta. I also would like to express my gratitude towards:

1. Ir. J. Tri. Hatmoko, M.Sc., as my final project supervisor. Whom always guide me through all the problem that I've encountered, whom always trust, support, and providing advice during this final project.
2. Sushardjanti Felasari, S.T., M.Sc., CAED., P.hD., as Dean of Faculty of Engineering, Universitas Atma Jaya Yogyakarta.
3. Ir. A. Y. Harijanto Setiawan, M.Eng., P.hD., as Chairman of Civil Engineering Department, Universitas Atma Jaya Yogyakarta/
4. Johan Ardianto, S.T., M.Eng., as the coordinator of International Civil Engineering Department, Universitas Atma Jaya Yogyakarta.
5. Mas Oktoditya Ekaputra, as Soil Investigation laboratory staff Universitas Atma Jaya Yogyakarta.
6. All the lecturers from civil engineering department, for all the knowledge that I learn during my study.

7. My beloved parents, Tjiam Andrew Homer and Hanny Wydiawan, whom always support me, give me home, strength and love. Love you i!
8. My beloved siblings, Audrey Laurentia and Fernando Dharmasaputra, whom always there to support me. I hope nothing but the best for you two.
9. My cousin, Kelvin Finsen, whom always help me during my final project. I hope nothing but the best for you bro!
10. Aldaka Wiguna, Freddy Suhendra, Kenfin Surya, and Vincent Michael Lim, my brothers from another mother, whom always there to support me all the times.
11. Aldwin Jordan Kanggara, Bima Puryatama Putra, Hutama Satria Wibawa, Jeffry Saputra, Joni, and Kevin Wisarta, as a member of 10 renegades, whom always support me.
12. My beloved ICEP 2014, Agus, Amju, Aris, Bagoes, Dede, Domi, Elsya, Evi, Kevin, Santi, Thea, Vivi and especially Vareskyu, whom always help me during my final projects.
13. Vidyasena Vihara Vidyaloka, whom I spend half of my Uni life with you guys, thank you for making the man I am today.
14. Djarum Beasiswa Plus batch 32 Yogyakarta, whom always support every one of its member.
15. All the people who are involved in my final project whom I can't mention, thank you guys for your support!

I realized that this report is far from perfect. Therefore, I will accept any suggestions and advice for this final project improvement. At last, I hope this report will be useful for the readers.

Yogyakarta, April 2017

Patrick Dharmasaputra

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# ABSTRACT

**SHEAR BEHAVIOR OF RICE HUSK ASH – CEMENT KILN DUST STABILIZED CLAY**, Patrick Dharmasaputra, Student ID Number 14.13.15719, year of 2018, Geotechnical Engineering, International Civil Engineering Program, Department of Civil Engineering, Universitas Atma Jaya Yogyakarta.

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Problematic soils such as clay, inhibits the worst possible characteristics that are avoided by engineers for instance, low shear strength. Cement kiln dust (CKD) and (RHA) is a by-product from their respective industry, it is hoped that utilization of CKD and RHA as a soil stabilizer will improve clay shear and plasticity characteristics. Purpose of this research was to investigate changes in clay shear behavior with the addition of CKD and RHA. Parameters that are observed in this research are shear strength parameters and plasticity index. Those parameters are observed by varying the CKD content, RHA content, and curing time. CKD and RHA content are varied between 10% to 20%, and the specimen were cured for 7, 28, and 36 days respectively. Result of the experiment showed that addition of 20% CKD, lead to plasticity index decrement from 34.4744% to 10.5%. Specimen with the lowest plasticity index then added with variation of rice husk ash content. In general, addition of CKD and RHA to the soil will eventually lead to plasticity index decrement. Addition of CKD and RHA did not only improve the soil in term of plasticity index. Shear strength of the mixtures also improved, by means of improved friction angle ($\phi$). On the other hand, cohesion shows a little contribution to the overall shear strength of the mixture.

**Key Words**: Shear Behavior, Plasticity Index, Curing Time, Cement Kiln Dust, Rice Husk Ash.