SUSTAINABLE DEVELOPMENT OF UN-REFINED FLY ASH IN ECO-FRIENDLY HIGH-VOLUME FLY ASH CONCRETE STRUCTURES

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Degree of Master of Science

Department of Materials Science and Engineering

University of Moratuwa
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Thesis submitted in partial fulfillment of the requirements for the degree Master of Science

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DECLARATION

I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Also, hereby I affirm that the details of this research report were exclusively carried out by me under the supervision of Mr. Guluwita and Dr. Ismail and all the information contained in this research report is certain and accurate to my knowledge.

…… ……..

Signature Date

The above candidate has carried out research for the Masters Dissertation under my supervision.

1……. Date……

Mr.SP.Guluwita

Internal Supervisor)

2……. Date……

Dr. MIMU Ismail

External Supervisor

ACKNOWLEDGEMENT

I take this great opportunity to express my profound gratitude and deep regards to Mr.Guluwita (Senior Lecturer, University of Moratuwa), for his exemplary guidance and monitoring.

I would also like to thank my external supervisor Dr. Ismail, Director, Construction Research Center, Tokyo Cement Co. (Lanka) PLC, for his keen interest showed in setting up a state-of-the-art industry for the fulfillment of my research program.

I sincerely thank Dr. Sivahar, Head of the Department, Dept. of Materials Science and Engineering, Faculty of Engineering, University of Moratuwa for the encouragement, guidance and great support extended from the initial to the final level which enabled me to conclude my research successfully.

My profound gratitude goes to Mr. Balamurugan, Quality Assurance Manager, Tokyo Cement Co. (Lanka) PLC for give me the valuable opportunity to carry out my testing activities with ease at the field.

ABSTRACT

Sustainable development in concrete industries is reducing the cement consumption in overall the world. Huge amount of carbon dioxide gas is released to the atmosphere during the production time of Portland cement. Carbon Dioxide is the leading contributor for the greenhouse effect and it directs to the global warming of world. In the present situation, most of the developed countries are thinking about these issues and implement severe rules and regulations to limit of the carbon dioxide emissions. So supplementary cementitious materials are required to reduce the consumption of Portland cement for the sustainable development. Fly Ash is one of the most abundant supplementary cementitious materials in worldwide. It is a by-product and waste material in thermal power stations. Disposal of fly ash is one of the major problems in the power stations because it leads to many environmental issues. Utilization of Fly Ash in the concrete industries, assure sustainable development by reducing cement consumption and also reduce the emission of carbon dioxide to the environment. The superior properties of fly ash provide much support to improve the rheological properties of fresh concrete and produce ultimate strength as well as better durability in long term hardened concrete. From the broad view it can be ensured that the usage of High-Volume Fly Ash is an environmentally friendly process and also it will enhance the quality of concrete such as high-performance concrete.

Key words – High Volume Fly Ash, Durability, Sustainable development

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