EFFECT OF CURING DAYS ON CONCRETE MADE BY PARTIALLY REPLACED CEMENT BY FLY ASH

A THESIS

BY

GROUP-02(B1)Submitted to the Department of Civil Engineering, Sonargaon University(SU), Dhaka in partial fulfillment of the requirements for the degree

of

B.Sc. IN CIVIL ENGINEERING

Sonargaon University (SU)
Department of Civil Engineering

FALL, 201

LETTER OF TRANSMITTAL

To
Tafsirojjaman
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Department of Civil Engineering Sonargaon
University (SU)
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Bangladesh.

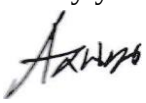
Subject: Submission of Project Report.

Sir,

This is our great pleasure that we are submitting here with the project report on 'Effect Of Curing Days On Concrete Made By Partially Replaced Cement By Fly Ash" It is an important topic. The project report has been done according to the requirement and guidelines ofthe Sonargaon University (SU).

We hope that this report will certainly help you in evaluating our project report on "Effect Of Curing Days On Concrete Made By Partially Replaced Cement By Fly Ash We would be very glad to provide any assistance in interpreting any part of the paper, whenever necessary.

Thanking You
Sincerely your



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DECLARATION

This is to declare that the work and material presented in the report has been carried out by us and has not previously been submitted to any University/College/Organization for any Academic qualification

We herby ensure that the work that has been presented does not breach existing copyright. We undertake to indemnify the university against any loss or damage arising from breach of the foregoing obligation.

Thanking You

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CERTIFICATION

This is to certify that the project paper on "Effect Of Curing Days On Concrete Made By Partially Replaced Cement By Fly Ash " is the bona fide record of project work done others for partial fulfillment of the requirement of the degree of B.Sc. in Civil Engineering from the Sonargaon University(SU).

This project work has been carried out under my guidance and is a record ofthe successful work.

Supervisor

Tafsirojaman

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ACKNOWLEDGEMENT

All praises and profound gratitude to the almighty Allah who is the most beneficent and the most merciful for allowing great opportunity and ability to bring this effort to fruition safety and peacefully.

We sincerely acknowledge and express my deep sense of gratitude to Tafsirojjaman (Lecturer) the guide of this project. As a guide he gave a maximum help and coordination in finishing the project work. With his past years of experience and teaching steered us to come out with success through the most difficult problems faced by us. His active interest in this topic and valuable advice was the source ofthe author's inspiration.

We would like to place on record our deep sense of gratitude to our guides for their cooperation and unfailing courtesy to us at every stage.

We sincerely would like to thank all instructors and staffs of the Civil Engineering Department of Sonargaon University (SU), Dhaka, which contributed in various ways to the completion of this thesis.

Finally, we would like to express our deepest gratitude to our entire group member whose support and manual labor contributed in various ways for the completion of this thesis work.

ABSTRACT

Concrete is a construction material that is mostly used across the world. It is a composite material made out of water, cement, fine aggregate (sand) and coarse aggregate (stones). However, the manufacturing process of raw materials used in concrete such as cement and aggregate causes environmental influences (emission of greenhouse gases and dust) and significantly consumes energy and natural resources.

Aggregate normally accounts 70 to 80 % of the entire volume of concrete, while water and cement account 20 to 30 $^{0}/0$. These percentages affect the mechanical properties of concrete. Replacing any of these materials by industrial waste material can have a positive impact on the environment. Hence, this project has focused on evaluating the opportunity of using one of these waste materials which is the fly ash as a partial replacement material for cement.

Fly ash is generally considered as a waste material that is produced as a by-product of coal combustion process. The physical and chemical properties of fly ash are similar to cement, which allows it to be used in concrete. The primary aim of this research is to determine the feasibility of using fly ash as a replacement of cement in concrete and their effects on the mechanical properties of concrete.

This Paper presents the results of an experimental investigation carried out to evaluate the mechanical properties (workability and compressive strength) of concrete mixtures in which cement was partially replaced with Fly Ash. Cement was replaced with two percentages (5%, 10%) of fly ash by weight. Tests were conducted for properties of fresh concrete (workability), and compressive strength was determined at 7, 14 and 28 days. Test results indicate significant improvement in the strength properties of plain concrete by the inclusion of fly ash as partial replacement of cement and can be effectively used in concrete structures.

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ABBREVIATION LIST

1.American Society for Testing and Materials (ASTM)

2. Aluminium oxide (A1203)

3. Calcium carbonate (CaC03)

4. Carbon dioxide (C02)

5. Calcium oxide (CaO)

6. Calcium hydroxide (CH)

7. Calcium silicate hydrate (CSI-I)

8. Dicalcium Silicate as (2CaO.Si02)

9. Fly Ash (FA)

10.High calcium Fly Ash (Class C)

11.Iron oxide (Fe203)

12. Low calcium Fly Ash (Class F)

13.Magnesium oxide (MgO)

14. Potassium oxide (K20)

15. Silicon dioxide (Si02)

IS. Sodium oxide (Na20)

17- Sulfur Trioxide (S03) 18. Tetracalciumalumina-ferrite C4AF (4CaO.A1203.Fe203)

19- Aluminate C3A (3CaO.A1203) 20. TricalciumSilicate C3S (3CaO.Si02)