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CANDIDATE'S DECLARATION

I do hereby certify that the work presented in the dissertation entitled “**DESIGN AND EXPERIMENTAL INVESTIGATION OF HIGH STRENGTH CONCRETE USING FLY ASH AND SILICA FUME**” in partial fulfillment of the requirements for the award of the degree of “**Master of Technology**” in civil engineering with specialization in “Structural Engineering” submitted in the department of Civil Engineering, **Delhi Technological University, Delhi**, is an authentic record of my own work carried out from August 2012 to July 2013, under the supervision of **Dr. Awadhesh Kumar, Associate Professor**, Delhi Technological University, Delhi.

I have not submitted the matter embodied in the dissertation for the award of any other degree or diploma.

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This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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ABSTRACT

This research study presents the design and results of experimental work on compressive strength and workability of High Strength Concrete containing fly ash and silica fume as mineral admixtures following the guidelines of BIS code 10262:2009. The aim of the study was to design high strength concrete having compressive strength of the order 95-105 MPa and above with good workability by varying the percentage of replacement of cement by two different mineral admixtures.

The work focused on concrete mixes having a constant total binder content of 635 kg/m^3 at constant dosage of superplasticizer. The compressive strength test were conducted upto an age of 90 days. Total eight mix were casted having (0, 20%, 25% and 30%) fly ash and (5% and 10%) silica fume. One mix contained fine fly ash in order to investigate its effect on the properties of concrete. And apart from this one ternary blended concrete mix having both fly ash and silica fume together was also tested.

The findings of this research indicate that both flyash and silica fume play a significant role in the long term strength gain of concrete. Fly ash reduces the early age strength gain whereas silica fume due to its high reactivity rapidly enhances the early strength gain in concrete. On one hand, addition of flyash increases the workability of mix while on the other hand addition of silica fume follows a reverse trend. Also the ternary blended concrete mix produced satisfactory results with intermediate workability and compressive strength equivalent to mix having cement content of 635 kg/m^3 .

CONTENTS

Chapter	Title	Page
	CANDIDATE'S DECLARATION	i
	ACKNOWLEDGEMENT	ii
	ABSTRACT	iii
	CONTENTS	iv
	LIST OF FIGURES	vii
	LIST OF TABLES	viii
	LIST OF GRAPHS	ix
1.	INTRODUCTION	1
	1.1 General	1
	1.2 Ingredient Materials	2
	1.2.1 Cement	2
	1.2.2 Sand/Fine Aggregate	2
	1.2.3 Coarse Aggregate	3
	1.2.4 Mineral Admixtures	4
	1.2.5 Chemical Admixture	4
	1.3 Role of Pozzolona	5
	1.4 Objective	6
2.	LITERATURE REVIEW	7
3.	THEORETICAL APPROACH	11
	3.1 Cement	11
	3.2 Making of Cement	11
	3.3 Chemical Composition	12
	3.4 Properties of Cement Compound	12
	3.4.1 Tricalcium Aluminate, C ₃ A	12
	3.4.2 Tricalcium Silicate, C ₃ S	13
	3.4.3 Dicalcium Silicate, C ₂ S	13
	3.4.4 Ferrite, C ₄ AF	13

Chapter	Title	Page
	3.4.5 Lime	13
	3.4.6 Silica	14
	3.4.7 Alumina	14
	3.4.8 Iron Oxide	14
	3.5 Hydration Process	14
	3.6 Reactions of Hydration	16
	3.7 Pozzolans	17
	3.8 Need of Pozzolanic Materials	17
	3.9 Pozzolanic Reaction	17
4.	EXPERIMENTAL PROGRAMME	19
	4.1 Materials	19
	4.2 Material Testing	19
	4.2.1 Tests for Coarse Aggregate	19
	4.2.1.1 Sieve Analysis/ Fineness Modulus	19
	4.2.1.2 Flakiness Index/Elongation Index	22
	4.2.1.3 Specific gravity	24
	4.2.1.4 Water Absorption	25
	4.2.1.5 Aggregate Impact Value (AIV) Test	25
	4.2.2 Tests for Fine Aggregate/Sand	26
	4.2.2.1 Sieve Analysis/ Fineness Modulus(FM)	26
	4.2.2.2 Specific Gravity/ Water Absorption	28
	4.2.3 Tests for Cement	28
	4.2.3.1 Fineness of cement	28
	4.2.3.2 Standard Consistency of Cement	29
	4.2.3.3 Initial Setting/Final Setting Time	29
	4.2.3.4 Specific Gravity	30
	4.2.4 Test for Mineral Admixture	30
	4.2.4.1 Sieve Analysis	30
	4.2.4.2 Specific Gravity	30
	4.2.5 Chemical Properties	31

Chapter	Title	Page
	4.3 Trials	31
	4.4 Design Procedure and Codal Provisions	31
	4.4.1 Setting of Target Mean Strength	32
	4.4.2 Selection of water-binder ratio	32
	4.4.3 Selection of Water content	33
	4.4.4 Calculation of Binder Content	35
	4.4.5 Estimation of Coarse Aggregate Proportion	35
	4.4.6 Estimation of Fine Aggregate Proportion	35
	4.5 Mix Proportions of the Ingredients	37
	4.6 Results and Discussions	37
	4.6.1 Slump Value	37
	4.6.2 Compressive Strength	39
	4.6.3 Cost Analysis	42
5	CONCLUSION	43
	5.1 Conclusions	43
	5.2 Future Scope	43
	REFERENCES	44

LIST OF FIGURES

Figure	Name	Page
3.1	Degree of hydration and compressive strength of OPC	15
4.1	Sieve Shaker	20
4.2	Coarse Aggregate- I	22
4.3	Instrument for Flakiness Index	23
4.4	Instrument for Elongation Index	23
4.5	Rejected Sand	27
4.6	Coarse Sand	27
4.7	Pycnometer	28
4.8	Le-Chatelier's Flask	31
4.9	Compressive Strength and w/b curve	34

LIST OF TABLES

Table	Name	Page
3.1	Shorthand	12
3.2	Chemical constituents of cement	13
4.1	Particle Size Distribution of CA	19
4.2	Sieve Analysis reading for CA-I	20
4.3	Sieve Analysis reading for CA-II	21
4.4	Guages For determining Flakiness/Elongation Index	24
4.5	Classification of CA on AIV basis	25
4..6	Fine Aggregates [19]	26
4.7	Sieve analysis of sand	26
4.8	Chemical Composition	32
4.9	Assumed Standard Deviation [21]	33
4.10	Maximum water content [21]	34
4.11	Volume of CA per unit volume of Concrete	36
4.12	Mix Proportioning of Concrete Mixes	37
4.13	Slump	38
4.14	Comparison of Compressive Strength at different ages	39
4.15	Material Price	42
4.16	Cost Comparison	42

LIST OF GRAPHS

Graph	Name	Page
4.1	Sieve analysis curve for CA-I	21
4.2	Sieve analysis curve for CA-II	21
4.3	Sieve analysis curve for sand	27
4.4	Slump comparison of Fly Ash concrete mixes	38
4.5	Slump comparison of SF concrete mixes	39
4.6	Compressive strength	40
4.7	Strength gain of Fly Ash concrete	41
4.8	Strength gain of SF concrete	41