International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 7
March 2018

Effect of Admixture Used For The Preparation Of Concrete mix

Upendra Singh Rajawat, Prof. D. Rastogi & Dr. Sanjay Tiwari
Civil Engineering Department, MITS Gwalior, Madhya Pradesh
rajawat118@gmail.com

Abstract

Admixture is characterized as a material other than cement, water and aggregate, that is utilized as element of concrete and is added to the batch quickly before or during mixing.Water proofer admixture may be obtained in powder, glue or paste or liquid from and may comprise of pore filling.It is a best concrete technology and ability to produce high quality concrete. That is a problem of water proofing of roofs, walls, bathrooms, toilet, kitchen, basements, swimming pools, water tank etc. have not been much reduced.

Introduction

Water proofer admixture may be obtained in powder, glue or paste or liquid from and may comprise of pore filling. It is one of the most important requirements of concrete that it must be impervious to water under two condition is that, firstly when subjected to pressure of water on one side, secondly, the adsorption of surface of water by capillary action. More investigation are of the opinion of concrete that carefully designed, effectively executed with sound materials will be impermeable to water. However by and large, placing, curing, and as a rule the different operations included at the site work fail to impress anyone. It is acknowledged that an utilization of a well picked admixture may end up being some advantage in decreasing the permeability. In case the use of admixture should in no case be considered as a substitute for bad materials. Admixture expected to compensate for cracks. **-:** It is a best concrete technology and ability to produce high quality concrete. That is a problem of water proofing of roofs, walls, bathrooms, toilet, kitchen, basements, swimming pools, water tank etc. have not been much reduced. There are number ofmaterials and method available in the country for water proofing purposes. It has remained as an unsolved complex problem. A successful water proofer is not depend upon quality and durability of materials but also the workmanship, environment and type of structure. Two types of water proofer are used in this study.

1. **Dr. Fixit LW+**
2. **Aqua Roff**

- **Dr. Fixit LW+** is specially formulated integral liquid waterproofing compound composed of surface active plasticising agents, polymers & additives. It is used as an additive for cement concrete, mortar & plasters. It makes concrete cohesive and prevents segregation.

METHODOLOGY ADOPTED-:

Concrete is a mix of cement, fine aggregate (sand),coarse aggregate (gravel or crushed stone), and water. Concrete is the most widely used construction material in the world. Concretes are similar in composition to mortars which are used to bond unit masonary. Mortars, however, are normally made with sand as the sole aggregate, whereas concretes contain both fine aggregates and much larger size

aggregates and thus usually have greater strength. Concretes therefore have a much wider range of structural applications, including pavements, footings, pipes, unit masonry, floor slabs, beams, columns, walls, dams, and tanks.In this study effect of various water proofers on compressive strength of concrete using destructive test equipment have been carried out. In this study water proofers Dr. fixit (LW+) and Aquaroff along with normal aggregate were used for prepairing cube specimens. Four types of mixed proportion are used – M15, M20, M25 and M30. The concrete cube prepared on normal aggregate and 60% and 40% different size 10 mm (40%), 20 mm (60%) aggregate is utilize for concrete cubes and water proofer 4ml per kg of cement is used to cast concrete cube. These cubes are tested on 7, 14, and 28 days. The compressive strength of these cubes is determined with the help of destructive equipment. The cement used in all mixers is Portland pozzolanas cement and natural sand is used in the experiment. The size of sand is 2 mm to 4.75 micron. The universal test machine (destructive) were performed on various specimens from different high strength concrete mixtures. In order to determine the effect of water proofer , Cube specimens with standard dimensions were tested at 7, 14 and 28 days. The determination of the strength of each mixture and specimen ages are based on the average of 3 Specimens.

OBJECTIVE

- The objective of this study is to see the effect of various water proofer compressive strength of various grades of concrete .

EXPERIMENTAL STUDY

TESTING OF MATERIALS-:Following laboratory methods are used to perform the test of materials:

- **Specific gravity**
- **Gradation**
- **Silt content of sand**
- **Impact value**
- **Flakiness & Elongation index test .**
- **Standard consistency test of cement.**
- **Initial and Final setting time of cement**
- **Compression test by UTM.**

Test Results

Flakiness index= 14.39 %

Elongation index = 24.33 %

SEIVE ANALYSIS OF FINE AGGREGATE

Sieve Size (mm)	% Reataning wt.	%Cumulative wt.	Finner % (N)	LIMITS
4.75	1.35	1.35	98.65	**90-100**
2.36	10.4	11.75	88.25	**75-100**
1.18	29.75	41.5	58.5	**55-90**
0.6	24.1	65.6	34.4	**35-59**
0.3	25.7	91.3	8.7	**8-30**
0.15	5.45	96.75	3.25	**0-10**

Thus for fine aggregate

Fineness modulus=3.08

Sand is of zone – II

Silt content of sand = 5%

SEIVE ANALYSIS OF COARSE AGGREGATES

For 20 mm aggregate

Sieve Size (mm)	% Reataning wt.	%Cumulative wt.	Finner % (N)
40	0.00	0.00	100.00
20	4.00	4.00	96.00
10	92.67	96.67	3.33
4.75	3.33	100.00	0.00

F.M. = 7.01

For 10 mm aggregate

Sieve Size (mm)	% Reataning wt.	%Cumulative wt.	Finner % (N)
12.5	0	0	100
10	2	2	98
4.75	21.5	23.5	76.5
2.36	76.5	100	0

F.M. = 6.26

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 7
March 2018

SPECIFIC GRAVITY

Material	Specific Gravity
20mm	2.79
10mm	2.75
Sand	2.61
Cement	3.10

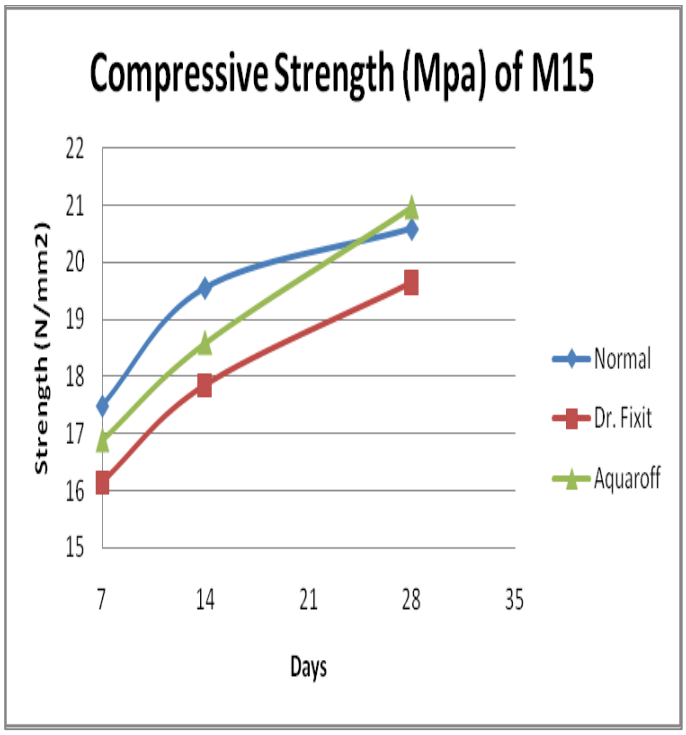
CONSISTENCY

The consistency of the cement in the study was found to be 35%.

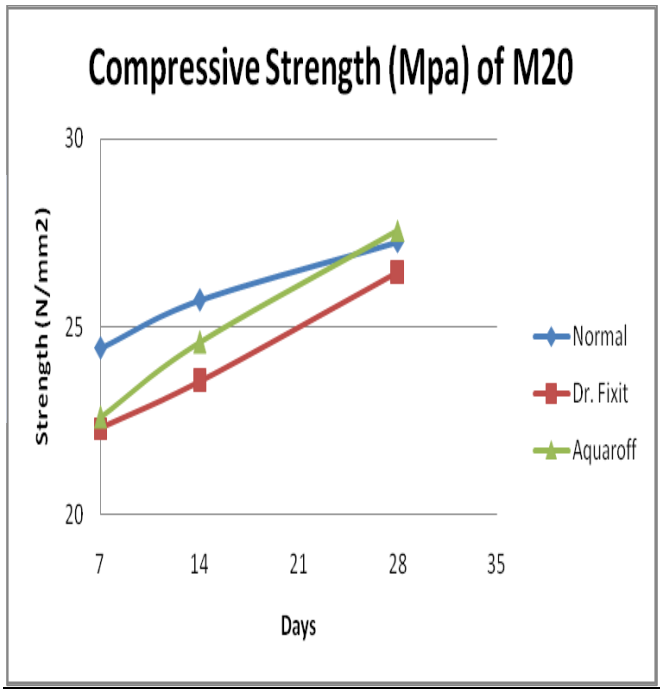
Initial and Final setting time

Type of cement	Initial setting time	Final setting time
PPC	55 min	483 min

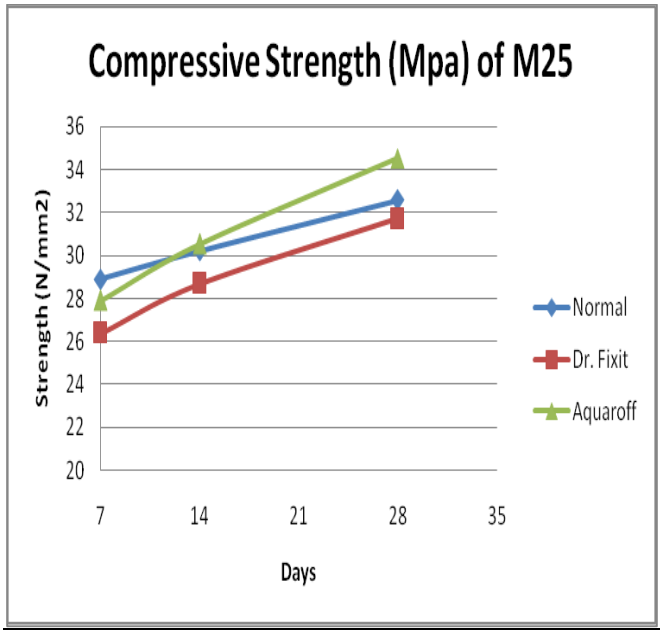
RESULTS AND DISCUSSION



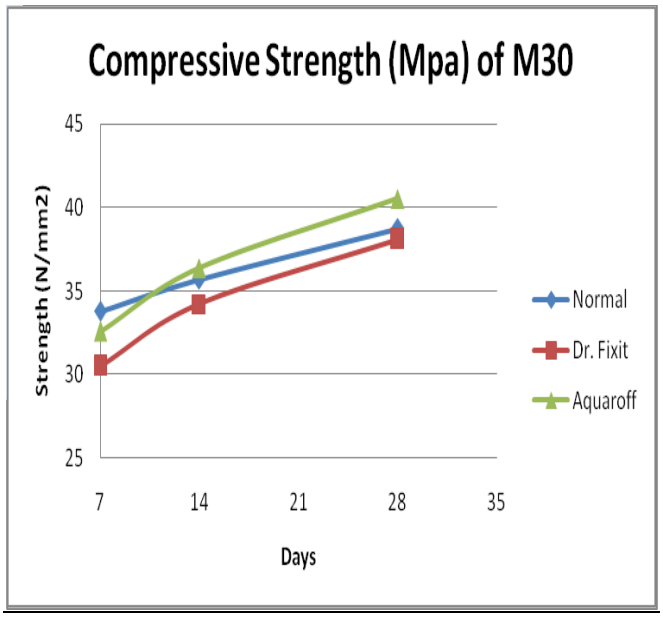
Graph 1: comparative study of M15 concrete having different water proofer along with normal concrete.



Graph 2: comparative study of M20 concrete having different water proofer along with normal concrete.



Graph 3: comparative study of M25 concrete having different water proofer along with normal concrete.



Graph 4: comparative study of M30 concrete having different water proofer along with normal concrete.

CONCLUSION:

- Following are the salient conclusions of the study-
- Compressive strength for 7 days of M15, M20, M25 and M30 grade normal composition reading is highest, and Dr. fixit water proofer is lowest in all cases.
- Compressive strength for 14 days of M15, M20, M25 and M30 grade normal composition reading is highest, and Dr. fixit water proofer is lowest in all cases.
- Compressive strength for 28 days of M15, M20, M25 and M30 grade Aqua Roff water proofer is highest, and Dr. fixit water proofer is lowest.

References:

[1]. Mukesh kumar, Effect ofdifferentwater proofing admixture on hydration of Portland cement, international journal of chemical technology vol.16, PP 499-506, November 2009

[2]. Salahaldein Alsadey, Influence of Super plasticizer on Strength of Concrete ,international journal of Research in Engineering and Technology (IJRET), Vol. 01, No. 3,2012 ISSN 2277-4378,2012.

[3]. Hasan katkhuda, Effect of Micro silica and water proofer on Resistance of Concrete to Phosphoric Acid Attack, Jordan journal of Civil Engineering, Volume 4, No.4,2010.

[4]. Chandrahas Sahu, An Experimental Study of Effects of Superplasticizer on Fresh and Hardened Properties of Concrete, international journal of engineering research and development e-ISSN: 2278-067X, p-ISSN: 2278-800X, www.ijerd.com Volume 8, Issue 1, PP.46-50, July 2013.

[5]. Debabrata Pradhan, Combinational Study of Mineral Admixture and Super Plasticizer in Usual Concrete, International Journal of Computational Engineering Research, Vol. 04, Issue.1,2012.

[6]. A. Annadurai, Development of mix design for high strength Concrete with Admixtures, IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN:2278-1684, p-ISSN:2320-334X, Volume 10, Issue 5, pp22-27, Jan 2014.

[7]. Anuradha Varshney, Pratibha Singhand Kiran Prajapati (2013) Effect of Novel Super plasticizer on Workability and strength of Ready Mixed Concrete, Section D-Research Paper Eur.Chem.Bull,Vol.2,issue(6),304-310,2013.

[8]. M. Palacios, F. Puertas, Effect of superplasticizer and shrinkage-reducing admixtures on alkali-activated slag pastes and mortars, Eduardo Torroja Institute (CSIC), P.O. Box 19002,28080 Madrid, Spain Received 11 November 2003; accepted 13 October 2004.

[9]. K. C. Biswal and Suresh Chandra Sadangi, (March 2011) Effect of Super plasticizer and silica fume on Properties of Concrete'' Paper presented in the Conference on Effect of Super plasticizer and Silica Fume on Properties of Concrete, Trivandrum, Kerala, 2011.

[10]. Ali Hussein Hameed, Effect of super plasticizer dosage on workability of self compact concrete, ISSN 1999-8716 Printed in Iraq Vol. 05, No. 02, pp. 66-81, December 2012.

[11]. Rohit Jain, K.K. Pathak, Rajesh Bhargava "A study on the Effects of Different Water Proofer on Compressive Strength of Concrete Cubes ISSN: 2319-6890,2347-5013 Volume No.5, Issue Special 1 pp: 111-115.