

An Experimental Study on Practical Replacement of Aggregate by using E Waste and Silica Fume as A Pozzlonic Material

Payal Talwekar, Akshay Mankar, Kishor Bairagi, Lokesh Ramteke, Pranay Mungle

Department of Civil Engineering

B. D. College of Engineering, Sevagram, Maharashtra, India

Abstract: Use of electronic waste and silica fume in concrete is a partial solution to environmental problems caused due to concrete. Use of e-waste and silica fume is going too studied in this report. In this study we are replacing cement by silica fume and coarse aggregate by e-waste. In this study we replacing cement by silica fume in 10% and replacing coarse aggregate by e-waste with a percentage of 5%, 10% and 15%. We decide to use M20 grade of concrete. We make concrete cubes of various proportions and check its compressive strength.

Keywords: Silica Fume, E-waste, Compressive Strength

I. INTRODUCTION

Concrete plays a non-deniable role in construction industry as it is the major construction material. Every material has some advantages and disadvantages, in the same way concrete emits heat during setting and also emits co₂ in the environment. This leads to changes in the environmental conditions in the developing regions. Electronic waste is a discarded electrical or electronic devices. Electronic waste components contains potentially harmful components such as cadmium and lead. Its disposal is necessary as it can cause various health problems to human being. In composite concrete the cement and coarse aggregate is replaced by silica fume and electronic waste which causes increase in strength of concrete and also reduces consumption of cement in concrete. This will help to protect the environment up to certain extent and may be economical depends on the materials added in the concrete. In this project work we have cast various combinations of concrete. In this work we replace cement by 5%, 10%, and 15% by electronic plastic waste with 10% silica fume. The details of results obtained along discussed in this report along with some suggestions

II. IDENTIFY, RESEARCH AND COLLECT IDEA

Whenever we are study all research paper and we have idea does the project are do first of all we study the concrete and the reaction of silica fume with replace cement and e waste a replace with aggregate we are found the strength of concrete increase 7 days and 14 days but after 28 days decreases the concrete.

III. WRITE DOWN YOUR STUDIESAND FINDINGS

Electronic waste components contains potentially harmful components such as cadmium and lead. Its disposal is necessary as it can cause various health problems to human being. In composite concrete the cement and coarse aggregate is replaced by silica fume and electronic waste which causes increase in strength of concrete and also reduces consumption of cement in concrete. This will help to protect the environment up to certain extent and may be economical depends on the materials added in the concrete. In this project work we have cast various combinations of concrete.

IV. EXPERIMENTAL INVESTIGATION

	Sr. no	Property	Res
	1	Standard Consistency	34
	2	Initial Settling Time	95 Mi
	3	Specific Gravity	3.1
	4	Fineness Of Cement	1.2

V. MATERIALS SPECIFICATIONS

- Cement of 53 grade(Mpa)
- Fine aggregate is Msand.
- Sand
- E-Waste
- Silica Fume

VI. EXPERIMENTALPROCEDURE

The specimen of standard cube of (150mm×150mm×150mm) were casted to determine the compressive strength of concrete. 12 specimen were tested for 7, 14 and 28 days with each proportion of silica fume and e-waste. Totally 36 cubes were cast for the compressive strength. The materials were weighed and mixed by hand mixing. The concrete was filled in different layers and each layer was compacted. The cubes were demoulded after 24 hrs. Cured in water for 7, 14 and 28 days, and then tested for its compressive strength as per Indian Standers.



Fig .1

VII. IMPROVEMENT AS PERREVIEWER COMMENT

Replacing 20% of the cement in concrete with silica fume meaningfully reduces the demand for cement, which results in the reduction of global anthropogenic CO₂ emissions, and also reduces demand for energy and natural resources, which can lower the production costs of concrete.

With the ability to significantly reduce the concrete footprint, silica fume also has a profound impact on extending the life cycle of concrete, the premiere global building material

To using e- waste ,a concrete there weight are down.

Means e waste are reduce the weight of concrete and silica fume there are very uses full because silica fume are increasing the strength of concrete as well as very excellent result are show very impressive .

VIII. CONCLUSION

This study is perform to find the effective ways to reutilize the plastic waste particles as coarse aggregate. It is also observed that the compressive strength is found to be optimum when coarse aggregate is replaced by 5% with E-waste at the age of 7days. Beyond it the compressive strength is decreasing. The compressive strength will gradually decrease when silica fume is added by 10% in addition with different proportions replacement of E-waste with coarse aggregate.

IX. ACKNOWLEDGEMENT

We would like to extend my gratitude and a very sincere thanks to my guide Prof. Shweta Rokde for his constant motivation and support during our project work. It is all because of his untiring, able guidance and valuable suggestions, that could synchronize my efforts in covering the many diverse features of the project and thus helped me for the smooth progress and success of the project. I truly appreciate and value his guidance and encouragement from the commencement to the end of this project work. His knowledge and company at the time of crisis would be remembered lifelong.

Thanks are due to Dr. G. V. Thakre, Principal, B. D. College of Engineering, Sevagram for giving us an opportunity to complete our Bachelor Degree in the college and providing necessary facilities. We are also thankful to Prof. R.S.Kedar, Head of Civil Engineering Department for his constant motivation and support. We are also thankful to teaching and non-teaching staff of the Civil Engineering department for their direct and indirect support from to time.

REFERENCES

- [1]. PanneerSelvam. N,GopalaKrishnaGVT,“RecycleofE-WasteinConcrete”InternationalJournalofScienceand Research (IJSR), Volume 5 Issue 4, April 2016, PP:1590-1593
- [2]. N. K. Amudhavalli, Jeena Mathew, “Effect Of Silica Fume On Strength And Durability Parameters Of Concrete” International Journal of Engineering Sciences & Emerging Technologies, August 2012. Volume 3, Issue 1, PP: 28-35©IJESET.
- [3]. Srivastava, Alvin Harison, P. K. Mehta, Atul, Rakesh Kumar, “Effect of Silica Fume in Concrete” International Journal of Innovative Research in Science, Engineering and Technology Volume 3, Special Issue 4, March2014, PP:254-259
- [4]. Suchithra S, Manoj Kumar, Indu V,“Replacement of Coarse Aggregate by E-Waste in concrete” International JournalofTechnicalResearchandApplicationse-ISSN:2320-8163,Volume3,Issue4(July-August2015),PP. 266-270.
- [5]. . Pravin A. Manatkar, Ganesh P. Deshmukh, “USE OF NON-METALLIC E-WASTE AS A COARSE AGGREGATE IN A CONCRETE” IJRET: International Journal of Research in Engineering andTechnology, Volume: 04 Issue: 03, Mar-2015,PP:242-246.
- [6]. Prof.VishalS.Ghutke,Prof.PranitaS.Bhandari,“InfluenceofSilicaFumeonConcrete”IOSRJournalof Mechanical and Civil Engineering (IOSR-JMCE), eISSN: 2278-1684, p-ISSN: 2320-334X, PP44-47.
- [7]. Lakshmi.RNagan.S,“StudiesonConcretecontainingEplasticwaste”InternationalJournalOfEnvironmental Sciences ISSN 0976 – 4402,Volume
- [8]. Amiya Akram, C. Sasidhar, K. Mehraj Pasha, “EWaste Management by Utilization of E-Plastics in Concrete MixtureasCoarseAggregateReplacement”InternationalJournalofInnovativeResearchinScience,Engineering andTechnologyISSN(Online):2319-8753ISSN(Print):2347-6710,Vol.4,Issue7,July2015,PP:5087-5095.
- [9]. Krishna Prasanna, M.Kanta Rao, “Strength Variations in Concrete by Using E-Waste as Coarse Aggregate” IJEAR Vol. 4, Issue Spl-2, Jan - June 2014 8. Amiya Akram, C. Sasidhar, K. Mehraj Pasha, “EWaste Management by Utilization of E-Plastics in Concrete Mixture as Coarse Aggregate Replacement” International Journal of Innovative Research in Science, Engineering and Technology ISSN (Online): 2319-8753 ISSN (Print) : 2347-6710, Vol. 4, Issue 7, July 2015, PP:5087-5095.