Review on Recycling of E-Waste with different fibre in concrete Technology

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***Abstract*- The world is emerging towards the online resources due to Covid-19. It is resulting into large use of electronic and computer devices worldwide. As new upgradation in E-devices is taking place, the old once again creating big problem for ecology and environment on earth surface. And to balance the E-waste produce and avoid the e-waste landfill all over the world. Hence vigorous and determinant attempts are made to use non-biodegradable E-Waste in concrete. The main intention is to add non-biodegradable E-Waste as fibers in concrete to upsurge the mechanical properties of concrete**

***Index Terms*— Electronic Waste, Strips, Fiber, Concrete, strength, Recycle.**

I. INTRODUCTION

Concrete is the material most employed by humankind in the construction of civil engineering works. Much testing and research has been done in order to better understand the behavior and to improve the performance of the material. This chapter will summarize briefly the main characteristics of the material and the contribution of fiber reinforcement. The aim of this chapter is to give the reader a picture of the technological aspects for the formulation of reinforced concrete with steel fiber in general and in case of plain concrete.

Concrete made with Portland cement has certain characteristics. It is relatively strong in compression but possesses a very tensile strength, limited ductility and little resistance to cracking and tends to be brittle. Internal micro cracks are inherently present in concrete and its poor tensile strength is due to the propagation of such micro cracks, eventually lading to brittle fracture of the concrete. In the past, attempts have been made to impart improvement in tensile properties of tensile members by way of using conventional method provide tensile strength to the concrete member, they however do not increase inherent tensile strength of concrete itself.

The weakness in tension can be overcome by the use of conventional rod reinforcement and to some extent by the inclusion of a sufficient volume of certain fibers. The use of fibers also alters the behavior of the fiber-matrix composite after it has cracked, thereby improving its toughness [5]. Strength of concrete is considered as a governing factor in the various types of concrete applications, because all other properties were assumed to be related to the strength. However, now, more stress is being laid on the performance criteria of concrete.

By adding non-biodegradable E-Waste as fibers in concrete to upsurge the mechanical properties of concrete this research paper E-waste material strips (Strips of external body of E- devices cut in length of Fibers) are used as Fibers. Fiber strips are added in proportion starting from 0, 0.25, 0.5 and 1% of total volume of concrete. In this article mechanical properties of concrete like compressive strength, flexural strength, bending strength and bond strength using E-waste strip as fiber.

II. LITERATURE REVIEW

Md. Masuduzzaman[1] investigated that One of the new waste materials used in the concrete industry is E-waste. The use of E-waste in concrete industry is measured as the most viable application for soothing the disposal of large amount of E-waste materials. E waste is one of the fastest growing waste streams in the world. The production rate of E-waste in developed countries rises from 1% to 2%. Total municipal solid waste in developing countries ranges from 0.01% to 1%. Suchlike, the increasing of E-waste is an emerging issue as well as it carriages serious

pollution problems to the human life. So, considering the environment options it needs to be measured especially on recycling concepts. E- Waste describes loosely rejected surplus, outdated, broken, electrical or electronic devices. The major cause of fast growing surplus of electronic waste around the globe is that Rapid technology change and low initial cost. For that reasons, several tones of E-waste need to be disposed per year. E-waste can create serious human health problem due to presence of numerous types of substances and environment problems if not handled properly. Owing to the shortage of coarse aggregate for the groundwork of concrete, partial replacement of E-waste with coarse was struggled in many research. This study reviewed the potential use of electronic waste in concrete as well as its environmental impact.

Ashwini Manjunath B[2] This paper investigated that Electronic scrap components, such as CRT‘s (cathode Ray Tube), may contain contaminants such as lead, cadmium, beryllium, or brominated flame retardants. Even in developed countries recycling and disposal of e-waste may involve significant risk to workers and communities and great care must be taken to avoid unsafe exposure in recycling operations and leaking of of materials such as heavy metals from landfills and incinerator ashes

One of the new waste materials used in the concrete industry is the recycled e plastic. For solving the disposal of large amount of recycled plastic material, the reuse of plastic in concrete industry is considered as the most feasible application. Recycled plastic can be used as coarse aggregate in concrete. However it is important to underline that reusing of waste is not yet economical advantages, due to high cost of transport in these effect on the total costs of production .Moreover, it is important not to neglect other costs, directly referable to the kind of waste, due, in particular, to the need of measuring gas emission, during firing, and the presence of toxic and polluting elements

Pratiksha Dayabhai Muchhadiya[3] investigated

The main source for E-waste in India is public and private sector institutions which contribute to around 70% of the total E-waste. Household waste is relatively small and accounts for just above 15%. We are only recycling 4% of it. Today, it has become a real challenge as to how to dispose electronic products without causing any damage to the environment. For solving the removal of enormous measure of E-waste material, reuse of Ewaste in solid industry is considered as the most attainable application. Presently a day's utilization of concrete is extremely enormous so accessibility of normal material is diminished and there is no material to satisfy the necessity of ventures. Subsequently the use of E-waste materials in solid aides in getting them utilized just as to diminish the cost of improvement materials.

Marian Sabău[4] investigated to design a concrete mix using plastic waste from the grinding of the housings of the electronic devices as coarse aggregate, the purpose being to deal with the sustainability issues of the e-plastic waste. The concrete thus obtained is to be used in nonstructural elements as dividing walls in social housing in Barranquilla. The control mix without plastic waste was designed to meet the standards of quality in terms of compressive strength established by the Colombian Norm of Earthquake Resistant Construction, NSR-10 (Asociación Colombiana de Ingeniería Sísmica 2010) for structural concrete. In addition, the cost reduction that can be obtained when making this type of concrete with recycled aggregates with respect to the costs involved in the production of traditional concrete made from mineral aggregates is shown. Based on this experimental study Vargas and Polo (2017) realized their undergraduate thesis.

Sai Venu Madhav.H[5] Investigated to The per capita consumption of plastics in the developed countries ranges from 500 to 1000 N while in India, it is only about 2 N. There is however now increase in awareness regarding the utilization of plastic as a useful building material in India. Plastics are normally stable and not biodegradable. So, their disposal poses problems. Research works are going on in making use of plastics wastes effectively as additives in bitumen mixes for the road pavements. Reengineered plastics are used for solving the solid waste management problems to great extent. This study attempts to give a contribution to the effective use of waste plastics in concrete in order to prevent the ecological and environmental strains caused by them, also to limit the high amount of environmental degradation.

III. REMARKS ON LITERATURE REVIEW

A. Owing to the shortage of coarse aggregate for the groundwork of concrete, partial replacement of E-waste with coarse was struggled in many research. This study reviewed the potential use of electronic waste in concrete as well as its environmental impact
B. For solving the disposal of large amount of recycled plastic material, the reuse of plastic in concrete industry is considered as the most feasible application. Recycled plastic can be used as coarse aggregate in concrete
C. Use of E-waste materials in solid aides in getting them utilized just as to diminish the cost of improvement materials.
D. The cost reduction that can be obtained when making this type of concrete with recycled aggregates with respect to the costs involved in the production of traditional concrete made from mineral aggregates is shown.
E. Effective use of waste plastics in concrete in order to prevent the ecological and environmental strains caused by them, also to limit the high amount of environmental degradation.

ACKNOWLEDGMENT

I like to express sincere thanks to my Guide Dr.R.V.Pakhale Sir and Co-Auther A.B. Wakankar Sir,Mr.K.R.Dachhawar and V.R.Hande for giving me valuable suggestions and ideas .I also thanks my department to give me moral support.

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