

Use of Banana Leaves Ash in Concrete

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Abstract— Cement is one of the materials that is generally utilized as a part of development all around the globe. This material is generally utilized in light of the fact that it has a few advantages, for example, more sturdy, vitality proficient, low upkeep, moderateness, imperviousness to fire, fabulous warm mass furthermore flexibility. This examination was directed to decide the ideal temperature and quality of cement to deliver great cementitious material by utilizing banana fiber ash. Agribusiness waste material can build the quality of cement. The wellspring of common fiber are found in plant and they are promptly ecological benevolent and modest. Furthermore, characteristic fiber ash has an incredible potential to enhance the execution of cement. In this study, compressive quality test was directed to know the quality of cement with three unique temperatures. Banana trunk is cut layer by layer and burn in heater. Banana leaves ash is replaced by cement in concrete upto 30% at an interval of 10% and then properties of concrete like compressive is checked after 7, 14 and 28 days curing. Grade of concrete used is M40.

Key words: Banana Fiber Ash, Concrete, Cement, Compressive Strength

I. INTRODUCTION

Farming waste is a crude material for industry these days. It doesn't just conservative additionally can prompt air contamination, for example, a worldwide temperature alteration. Agribusiness waste material generally arranged into landfill or arrange by open smoldering that may prompt air contamination. This waste material can be utilized to build the quality of cement. The wellspring of characteristic fiber as cementitious material are found in plant and they are promptly ecological cordial and in addition shabby. Likewise, characteristic filaments, for example, banana have a great potential to enhance the properties of materials, and could be utilized adequately to enhance the execution of cement.

The general goal of this study is to research the compressive quality of solid banana fiber as cementitious to deliver high quality cement with various temperature. The particular destinations of this study were, To decide the compressive quality of solid utilizing banana leaves ash as waste agribusiness and To decide the compound properties of banana fiber ash smoldering with various temperatures as cement replacement.

II. METHODOLOGY

Ordinary Portland cement is used in this project with specific gravity 3.15, initial setting time along with final setting time is 92 minutes and 215 minutes respectively, consistency 29%, soundness 2 mm, compressive strength 38.45 mpa after 28 days of curing and fineness modulus 4.2%. natural river sand is used as fine aggregate with specific gravity 2.60, water absorption 0.5%, silt content 0.30%, bulk density 1580 Kg/m³. Coarse aggregate of 20

mm size is used in this project with specific gravity 2.65, water absorption 0.55%, Average 10% fine Value (TFV) – 80 kN, Bulk Density – 1610 Kg/m³, Crushing Value – 13.80% and Impact Value – 12.75%, banana leave is collected locally then it is dried in air and then it is burn, its ash is collected and then mixed in concrete. Mix design is done as per IS 10262: 2009, with water cement ratio 0.4. On hardened concrete compressive strength test is performed.

III. RESULT AND DISCUSSION

Fig 1 and Fig 2 shows compressive strength of the concrete when cement is replaced by banana leaves ash in concrete. From the experiments it is clear that optimum value for banana leave ash is 20%. Initially upto 20% when banana leaves ash is added in concrete it increases compressive strength then compressive strength of the concrete is decreased in 30% replacement mix of concrete.

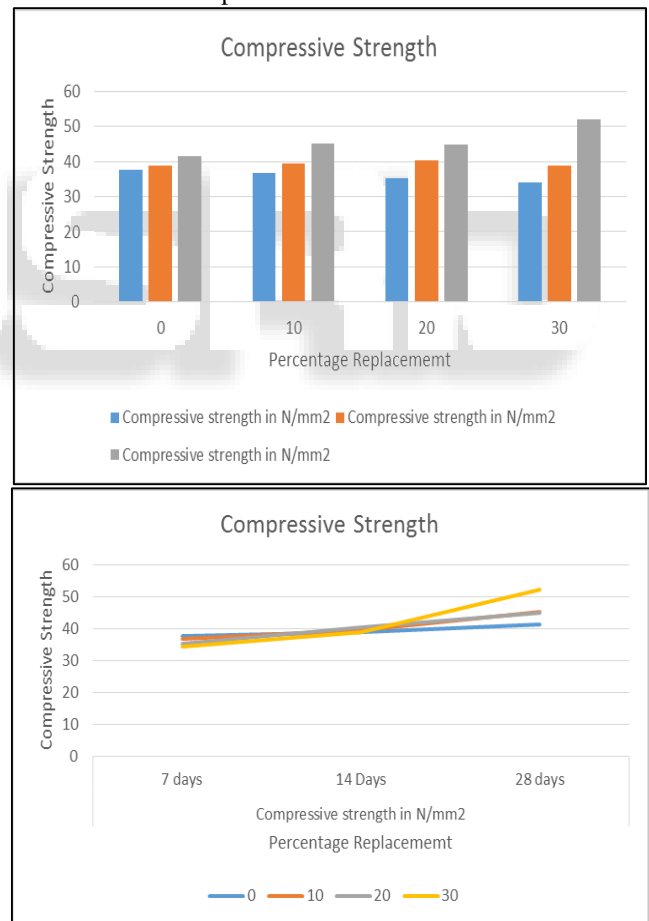


Fig. 1 & 2: Graph 1 and Graph 2: compressive strength of banana leaves ash in concrete

Disappointment of the 3D shape examples under pressure stacking is broke down at splitting state and fall state. The outcomes are contrasted and that of the control example. It is watched that control example grows thick vertical splits at the season of disappointment furthermore spalling of cement happens at breaking state itself. Some unit of coarse total from the cement lattice is likewise noted.

Yet, in BLP utilized cement, there is no spalling of cement at splitting state. Just slanted dainty breaks are produced and no indications of vertical splits in the fizzled example. Spalling of cement happens in the breakdown state as it were. Likewise there is no unit of bond between coarse total and cement network even at breakdown state. Test example at breaking state and crumple state.

IV. CONCLUSION

20% replacement of cement by supplementary cementitious material made with waste banana leaves ash expands the compressive quality of cement by around 20-30% at 28 days. Banana leaves ash utilized solid takes 14 days to build up the objective mean quality and following 14 days the quality improvement is more than that of the control example. Banana leaves ash displays pozzolonic property and it is likewise joining in hydration process. Splitting in Banana leaves ash utilized cement is lesser than control example. Further, Ternary mixed cement concrete joining consolidated mass of Banana leaves ash is threw for different rate blends and are to be threw and tried for both compressive and rigidity. Taking into account writing study, composite SCM material made with Banana leaves ash at proportion of 2:1 is relied upon to amplify the quality parameters and in this manner this rate consideration of Banana leaves ash might be utilized for medium unit solid where higher quality improvement is required than the utilization of 100 percent portland cement as the main fastener.

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