Review on the Effect of Sugarcane Bagasse Ash Waste on Behaviour of Cement Mortar and Concrete as the Restricted Replacement

Arun kumar Jha
Research scholar, Civil engineering, SRGI, Jabalpur (M.P.), India.

Anil Sanodiya
Asst. Prof, Civil engineering, SRGI, Jabalpur (M.P.), India.

Rakesh Rathor
Asst. Prof., Civil engineering, SRGI, Jabalpur (M.P.), India.

Abstract – India is the second largest in major sugar producing countries after Brazil. Bagasse is the waste generated after the sugar production process and further can be utilized in various other products as a raw material and also combusted directly in the boiler for power generation in sugar mill itself. There is generation of ash after direct combustion. Sugar cane bagasse ash is the waste product of the combustion of bagasse for energy in sugar factories. It is further disposed of in landfills and is now becoming an environmental burden. Present paper focused to give a review based on various pre-research to get the target of the present examination is to think about the utilization of Sugar stick Bagasse Ash as an incomplete swap for Portland bond in concrete and in mortar to ration nature, decrease bond utilization and increment cost proficiency.

Index Terms – Partial Replacement, Concrete, Workability, Durability Compressive Strength, Tensile and Flexural Strength.

1. INTRODUCTION

1.1. General

All through the world Ordinary Portland Cement is perceived significant development material. Standard Portland bond is the customary building material that really is in charge of around 5% - 8% of worldwide CO2 discharges. This ecological issue will no doubt be expanded because of exponential request of Ordinary Portland Cement (OPC). (Bangar Sayali S et al)

Bond added substances are basic nowadays to improve the designing properties of concrete glue and cement. In writing, extraordinary added substance materials were utilized, for example, silica smolder, rice husk fiery remains, fly slag, and electric-curve heater tidy.

As of late, there has been an expanding pattern towards more proficient use of agro-mechanical buildups, including sugarcane bagasse. A few procedures and items have been accounted for that use sugarcane bagasse as a crude material. These incorporate power age, mash and paper generation, and items in view of aging. Sugarcane is one of the real harvests developed in more than 110 nations and its aggregate creation is more than 1500 million tons. In India just, sugarcane generation is more than 300 million tons/year that reason around 10 million tons of sugarcane bagasse cinder as an un-used and squander material. After the extraction of all conservative sugar from sugarcane, around 40-45% stringy deposit is acquired, which is reused in an indistinguishable industry from fuel in boilers for warm age deserting 8 - 10 % fiery debris as waste, known as sugarcane bagasse powder (Prashant O Modani et al)

The Bagasse Ash contains high measures of un-consumed matter, silicon, aluminum and calcium oxides. Be that as it may, the powder procured specifically from the factory are not receptive as a result of these are scorched under uncontrolled conditions and at high temperatures. (N. B. Singh et al)

The powder, in this manner, turns into a mechanical waste and stances transfer issues.

1.2 Materials

Customary Portland concrete is utilized for the examination. The bagasse fiery remains utilized as a part of the examination is gotten from a Corporate Sugar Factory (Kareli Sugar Mill) in the adjacent region. The sugarcane bagasse comprises of around half of cellulose, 25% of hemicellulose and 25% of lignin. Every ton of sugarcane creates roughly 26% of bagasse (at a dampness substance of half) and 0.62% of leftover cinder. The deposit after ignition exhibits a concoction piece overwhelms by silicon dioxide (SiO_2).

2. LITERATURE REVIEW

Most of the researchers has been carried out there research work based on to find out the various alternative material to

mix with the cement and find out there performance. The latest researches in this era are as follows:

“A new treatment for coconut fibers to improve the properties of cement based composites – Combined effect of natural latex/pozzolanic materials” (2017), Everton Jose da Silva, Maria Lidiane Marques, Fermin Garcia Velasco, Celso Fornari Junior, Francisco Martínez Luzardo, Mauro Mitsuuchi Tashi

This paper presents the results of experimental study with a new coconut fiber-cement composite (CFC). To get a material with enhanced execution so as to diminish the measure of calcium hydroxide introduce on the fiber surface, four types of coconut fiber treatment were tried. A few blends of regular latex, water and pozzolanic materials (silica smolder or metakaolin) were assessed by corruption test and quickened maturing through cycles of wetting and drying CFC tests. To decide the mechanical properties got from every treatment, flexural tests on CFC composites were performed. After the flexural tests, the strands were expelled from the examples and dissected by filtering electron microscopy (SEM), vitality dispersive X-beam spectroscopy (EDX), Fourier Transform Infrared spectroscopy (FTIR) and thermo-gravimetric examination (TGA). The outcomes demonstrate that the treatment completed with the regular latex polymer film joined with a pozzolan layer enhanced the execution and sturdiness of the CFC

"Quantitative investigation of fly powder in solidified concrete glue", (2017) by Yue Li, Hui Lin, Zigeng Wanga, Construction and Building Materials 153 (2017) 139– 145Fly ash (FA) is one of the common supplementary cementitious materials used in cement and concrete. Because of the complexity of morphology, component, hydration and other factors of FA, it is very difficult to measure the content of FA in hardened concrete. As per the normal for the unburned carbon in FA neither dissolving in concrete nor taking part in the synthetic response, three various types of FA were utilized to get ready FA-bond glues with various volumes. At that point particular disintegration technique and warm investigation were utilized to quantitatively examine the substance of FA in solidified glue. The outcomes demonstrated that the distinctions of testing information were under 1.5%, contrasted and the hypothetical esteems by the technique for specific disintegration joined with warm investigation. In this manner, it is inferred that the technique for particular disintegration joined with the warm examination can gauge the substance of FA in solidified FA-concrete framework all the more precisely.

“Influence of Polymer Powder on Properties of Cemented Paste Backfill”, (2017) by Babak Koohestani, Bruno Bussière, Tikou Belem, Ahmed Kouba, International Journal of Mineral Processing

This study investigates the influence of ethylene-vinyl acetate/vinyl ester of versatic acid (EVA/VE), a redispersible polymer powder, on the mechanical, chemical, and microstructural properties of sulfidic and non-sulfidic cemented paste backfill (CPB). Different EVA/VE amounts (7.5 to 20 wt% of cement mass) are examined in CPB mixtures. To assess the influence of EVA/VE on the CPBs consistency (fresh state), slump height was measured using a small Abram’s cone. Uniaxial compressive quality (UCS) testing was led to decide the impact of polymer powder on the mechanical strength development of CPBs, and mercury intrusion porosimetry (MIP), scanning electron microscopy (SEM), and differential thermo-gravimetric analysis (DTG) were used to determine the influence of polymer powder on the microstructure and mineralogy of hardened CPBs. The achieved results implicated the dependency of polymer powder effectiveness on the tailings type. Of the different polymer powder proportions used in this study, the addition of 15% EVA/VE (based on the mass of binder) was only effective in improving UCS values of sulfidic tailings. The MIP, DTG, and SEM comes to fruition in like manner demonstrate that the extension of 15% polymer powder was helpful for compound and microstructural change of sulfidic CPBs so to speak.

"Data for the physical and mechanical properties of staple filaments solid paste composites" by Ertug Aydin, Data in Brief14 (2017)307– 312The information exhibited in this are gathered of their inquiry rundown of "Staple-wire-strengthened high-volume fly-powder bond glue composites". This information article gives general data about the novel high volume fly fiery debris concrete glue composites made out of different volume of staple wires. The dataset here likewise causes there adders to comprehend the systems of staple wires on physical and mechanical properties of unadulterated bond glue composites. “Fiber-reinforced concrete with mineral fibers and nanosilica” (2017) by Urkhanova Larisaa, Lkhasaranov Solbona , Buiantuev Sergeib, 18th International Conference on Rehabilitation and Reconstruction of Buildings 2016, CRRB 2016, Procedia Engineering 195 (2017) 147 – 154

The article displays the examination aftereffects of mineral fiber use as a fortifying part for concrete. The acquaintance of nanosilica with fiber bond pieces enhances the erosion protection of the mineral fiber, because of the fact that nanosilica ties Ca(OH)2 amid Portland bond hydration. Physical and mechanical properties of bond and fiber-fortified cement with the presentation of mineral filaments from basalt and slag squander materials and nanosilica are resolved. A huge change of the properties of fiber-fortified cement is clarified by the perplexing activity of mineral filaments and nano-silica.

"Impacts of soluble base treated bamboo filaments on the morphology and mechanical properties of oil well concrete", (2017), Ming Li a, Song Zhou, Xiaoyang Guo, Construction and Building Materials 150 (2017) 619– 625

Soluble base treated bamboo fiber (BF) was utilized to strengthen the oil well bond, and the fortified concrete was broke down by means of examining electron microscopy (SEM) and mechanical testing. The outcomes demonstrated that BF got a bigger surface territory for filtering out the solidifying materials amid 10% NaOH arrangement treatment. Suitable antacid treated BF substance can viably enhance sturdiness, flexural quality and part tensile quality of oil well concrete because of better scattering of soluble base treated BF inside the bond, better interfacial grip with concrete lattice and denser microstructure of salt treated BF-fortified concrete.

"Properties Improvement of Fly Ash Cenosphere Modified Cement Pastes Using Nano Silica" (2017), Asad Hanif, Pavithra Parthasarathy, Hongyan M, Tianyuan Fan , Zongjin Li doi: 10.1016/j.cemconcomp.2017.04.008.

In this examination, the impact of nano silica (NS) on the properties of bond glues fused with of fly fiery remains cenospheres (FACs) has been researched. A settled measure of 1 % NS was added to concrete glues containing different proportions of FAC. It was discovered that NS was gainful in enhancing the mechanical quality of the FAC adjusted bond glues. At the 7 – day age, the quality increment for NS altered glues was around 17 % when contrasted with glues without NS. Be that as it may, the quality upgrade impact diminished with expanding age and FAC content. The dense microstructure of the NS adjusted glues compensated for the higher porosity related with FAC consolidation, prompting the diminished aggregate porosity. With NS, there was better holding of the FAC particles in the network, because of the upgraded interface. The decreased Ca(OH)2 content and halfway consumed FAC round shells at the early age demonstrated that NS expanded the pozzolanic action of FAC in the bond glues.

"Fiber-fortified cement with mineral strands and nano-silica", (2017), Urkhanova Larisaa, Lkhasaranov Solbon, Buiantuev Sergei, eighteenth International Conference on Rehabilitation and Reconstruction of Buildings 2016, CRRB 2016

The article shows the exploration aftereffects of mineral fiber use as a strengthening segment for concrete. The colleague of nanosilica with fiber bond compositions improves the disintegration insurance of the mineral fiber, in view of the fact that nanosilica ties Ca(OH)2 in the midst of Portland concrete hydration.Physical and mechanical properties of concrete and fiber-strengthened cement with the presentation of mineral strands from basalt and slag squander materials and nanosilica are resolved. A huge change of the properties of fiber-fortified cement is clarified by the mind boggling activity of mineral strands and nanosilica.

"An examination concerning the impact of superabsorbent polymers on the properties of glass powder changed bond glues", (2017), Mahsa Kamali, Ali Ghahremaninezhad, Construction and Building Materials 149 (2017) 236– 247

This investigation inspects superabsorbent polymer (SAP) retention, mechanical quality, hydration, and electrical resistivity of glass powder altered concrete glues. The ingestion of SAP was checked utilizing optical microscopy and appeared to be higher when glass powders were utilized. Expansion of SAP was found to enhance hydration because of inside curing. The bond glues with SAP showed a diminished compressive quality due to macrovoid arrangement. The glass powder changed bond glues encountered a vast diminishment in electrical resistivity because of SAP expansion; expanded pore network in these concrete glues is recommended as a conceivable reason for the decrease in electrical resistivity.

"Impacts of graphene oxide agglomerates on workability, hydration, microstructure and compressive quality of concrete glue", (2017), Xiangyu Li , Yan Ming Liu, Wen Gui Li , Chen Yang Li , Jay G. Sanjayan , Wen Hui Duan , Zongjin Li, Construction and Building Materials 145 (2017) 402– 410

In this investigation, the impacts of graphene oxide (GO) agglomerates on the workability, hydration, microstructure, and compressive quality of concrete glue were tended to. The workability of concrete glue was lessened as a result of the nearness of GO agglomerates, which ensnare a lot of water. The minislump diameter was reduced by 21% with the incorporation of 0.03% by weight GO in cement paste. Hydration of the cement paste was accelerated due to nucleation sites provided by GO agglomerates serving as seeding material in the cement paste. The incorporation of GO refined the pore structure of the cement paste. The incorporation of GO was found to have much greater impact on macropores than on large and small mesopores. At 28 days, the incorporation of 0.04% by weight GO produced a 14% improvement in the compressive strength of cement paste. Below 0.03%, the incorporation of GO had no positive effects on compressive strength.

“Properties of Portland cement pastes enriched with addition of calcined marl” (2017), Ravil Z. Rakhimov, Nailia R. Rakhimov, Albert R. Gaifullin, Vladimir P. Morozov, Journal of Building Engineering, http://dx.doi.org/10.1016/j.jobe.2017.03.007

Increasing global production of Portland cement and the necessity to reduce CO2 emissions have resulted in the need to increase the production and application of blended cements enriched with supplementary cementitious materials (SCMs). As of late, polymineral dirts, which are liberally accessible over the globe, have picked up consideration as promising crude materials for the generation of SCMs. In this examination, the impact of marl on the properties of solidified Portland concrete was explored.The Portland cement pastes enriched with marl (5–20%) calcined at 400–800 °C and ground up to 250–800 m2/kg showed better physical-mechanical properties than those enriched with metakaolin. This study demonstrates the

potential of calcined marl to be used as an effective pozzolan additive for Portland cement.

Examination of quality and hydration attributes in nano-silica fused bond glue", (2017), Madhuwanthi Rupasinghe a, Rackel San Nicolas, Priyan Mendis, Massoud Sofi, Tuan Ngo, Cement and Concrete Composites (2017), doi: 10.1016/j.cemconcomp.2017.02.011.

A hydration demonstrate for Portland concrete glues changed with nano-silica in incomplete substitution is defined in view of the nucleation development process from microstructural examinations after some time. The model is aligned against thermo-gravimetry, X-beam diffraction and calorimetry information for four distinctive substitution rates from 0 to 12 wt% and is approved by backscattered electron microscopy. Limited component based compressive quality expectations utilizing agent volume component examination of the nano adjusted bond glues concurred with the test esteems. The model forecasts demonstrate that a rate of 8 wt% is the ideal substitution level of concrete by nano-silica prompting a high thickness network advancing a most extreme mechanical quality.

"Consolidation of nano-materials in concrete composite and Geopolymer based glue and mortar – An audit", (2017), Mathialagan Sumesh, U. Johnson Alengaram , Mohd Zamin Jumaat, Kim Hung Mo, Mohammed Fouad Alnahhal, Construction and Building Materials 148 (2017) 62– 84

The synopsis of advancements in incompletely supplanted bond composite and geopolymers by mechanical results are displayed alongside various nano-materials. Numerous noteworthy relationships have been considered on relationship with the better comprehension of the interfacial progress zone, microstructural execution, blend outline attributes, setting conduct, mechanical properties, solidness and bond quality. The impacts of different molecule estimate and diverse kinds of nano-materials and their ideal level of substitution have been investigated on bond composite and geopolymer items. Utilization of nano-materials in both halfway supplanted bond composite and geopolymers has noteworthy advantages towards the execution of mortar and glue. The wellbeing related issues on utilizing nano-materials and strategies can be utilized to defeat the dangers of presentation have been examinedJohnson Alengaram , Mohd Zamin Jumaat, Kim Hung Mo, Mohammed Fouad Alnahhal, Construction and Building Materials 148 (2017) 62–84

The summary of developments in partially replaced cement composite and geopolymers by industrial by-products are presented along with different nano-materials. Many significant correlations have been studied on association with the better understanding of the interfacial transition zone, microstructural performance, mix design characteristics, setting behavior, mechanical properties, durability and bond strength. The effects of various particle size and different types of nano-materials and their optimal level of replacement have been reviewed on cement composite and geopolymer products. Use of nano-materials in both halfway supplanted concrete composite and geopolymers has huge advantages towards the execution of mortar and glue. The health related issues on using nano-materials and methods can be used to overcome the risks of exposure have been discussed

“Mechanical properties of Geopolymer composites reinforced with natural fibers” (2016) by K. Korniejenko , E. Frczek, E. Pytlak, M. Adamski, International Conference on Ecology and new Building materials and products, ICEBMP 2016, Procedia Engineering 151 (2016) 388 – 393

Geopolymer composites have recently become a promising ecological alternative to the traditional cementitious materials. They are cost-effective, environmentally friendly and their production involves relatively small amount of energy .They have likewise great compressive quality, strength and warm properties being profoundly impervious to fire and warmth. In any case, these composites have moderately low elastic and flexural quality, which constrains their utilization in numerous zones. This paper portrays the mechanical properties of the Geopolymer in light of fly fiery remains and strengthened with short characteristic strands, for example, cotton, sisal, raffia and coconut. The investigation is proposed to break down the impact of expansion of different characteristic strands on the mechanical properties of the Geopolymer. The empirical part of the research was based on the compressive strength tests, flexural strength tests and detailed microstructure examination. The results show that the appropriate addition of natural fibers can improve the mechanical properties of Geopolymer composites.

“Influence of carbon nano-fiber clustering on the chemo-mechanical behaviour of cement pastes”, (2016), Lesa Brown, Florence Sanchez, http: // dx.doi.org /10.1016 / j. cemconcomp. 2015.10.008

The influence of carbon nano-fiber (CNF) clustering on the chemo-mechanical behaviour of cement pastes subjected to a decalcifying environment was studied. Portland cement pastes with and without CNFs were exposed to a concentrated solution of ammonium nitrate to accelerate decalcification. Microstructural changes and evolution of the porosity were examined as a function of exposure duration. Changes in the flexural response of the cement paste with CNFs were studied and reviewed in relation to CNF clustering and microstructural evolution. Results presented a strong coupling among the decalcification, CNF clustering, microstructural evolution, with the flexural assets of the cement paste. Later 7 days of decalcification via NH_4NO_3, the CNF clusters performed as weak zones that minimised the flexural strength retention of the cement paste. Conversely, afterward 125 days of decalcification by NH_4NO_3, a dissolution-filling mechanism

within the clusters produced a better bond with the neighbouring cement paste, reducing down the loss of flexural strength with also providing further ductility to the cement paste.

"Influence of type of fibers on the properties of high performance cement-based composites" Valeria Corinaldesi, Alessandro Nardinocchi, (2016), Construction and Building Materials 107 (2016) 321–331

In this work twenty fiber reinforced cement-based composites (FRCCs) were studied, in which CaO-based expansive agent was used. Five different kinds of fibers were added, three hooked metallic: steel, zinc-coated and brass-coated; two plastic: corrugated polypropylene (PP) and hooked polyethylene terephthalate (PET) fibers. All the twenty mixtures, as well as a reference mixture without fibers, were characterized by recording fresh consistency, compressive and flexural strength, as well as drying shrinkage strains. Results achieved presented an improved flexural strength if high quantity of CaO-based expansive agent is used with either zinc or brass-coated fibers. The purpose could be the development of calcium hydroxide zincate (CHZ) crystals at the edge amongst fibers and cement paste indorsed via alkaline surroundings. These CHZ crystals were observed by SEM, and they are likely able to enhance the quality of the interface fiber-matrix by increasing adhesion. On the other hand, the use of CaO seemed to accelerate PET fiber degradation due to alkaline hydrolysis leading to reduced FRCC mechanical performance. "Effect of olive waste (Husk) on behaviour of cement paste" (2016), Sharaf Alkheder, Yasmeen T. Obaidat, Madhar Taamneh,

Jordan is a well-known nation in positions of olive trees agriculture that resulted in a mass making of olive oil products. The huge amounts of olive unused (husk) that obtained from olives processing to crop olive oil characterise an environmental challenge in the country. The theme in research comes to use olive waste as a fractional replacement for Portland cement in cement paste to save the environment, decrease cement consumption as well as improve cost efficiency. The squanders were scorched appropriately in a broiler and kept up for 6 hr until the point that it was completely changed in to fiery debris. At that point, the stove was killed and powder were permitted to cool. In the wake of cooling, the material passed strainer # 200 were utilized. The sieved fiery remains were utilized as a part of the bond blend as a halfway concrete swap for influencing the mortar and bond to glue. Ordinary consistency and setting time were resolved and additionally soundness, compressive quality. Results showed that typical consistency of the bond glues containing distinctive level of olive waste is some way or another lower than that of the normal concrete glue and somewhat diminishes with expanding the rate. The outcomes likewise demonstrated that the compressive quality of solidified mixed concrete glue containing diverse rates of olive squanders delicately diminish with olive waste substance at 3, 7, and 28 days.

"Portland cement paste with aligned carbon fibers exhibiting exceptionally high flexural strength (N 100 MPa)" (2016), Manuel Hambach , Hendrik Möller , Thomas Neumann, Dirk Volkmer, Cement and Concrete Research 89 (2016) 80–86

Here, authors present a spout infusion method for carbon fiber-strengthened concrete glue prompting unidirectional arrangement of bond installed short carbon filaments that take after the development heading of the guided spout. In contrast with non-fortified bond glues, this novel material shows a huge increment of its flexural quality after admixing and adjusting 1 to 3 percent (by volume) of hacked carbon strands. Bond glues containing carbon strands adjusted in the pressure bearing in this way get high compressive and flexural quality esteems in the meantime. Mechanical tests demonstrate the material to withstand flexural loads bigger than 100MPa in conjunction with a redirection solidifying conduct looking like that of elite fiber-fortified cementious composites at generally low fiber volume . Bits of knowledge into the arrangement, fiber arrangement, rheology and the crack conduct of this material are introduced in this examination.

"Degradation of natural fiber in ternary blended cement composites containing metakaolin and montmorillonite", (2016), Jianqiang Wei, Christian Meyer, Corrosion Science http://dx.doi.org/10.1016/j.corsci.2016.12.004

The impact of a coupled substitution of metakaolin and montmorillonite in Portland bond on debasement of regular fiber was explored. Notwithstanding solidness of fiber-concrete composites, corruption of the implanted characteristic fiber was specifically examined by methods for malleable properties, crystallinity, synthetic segments and microstructure. The outcomes demonstrate that the mix of these earth minerals approves their synergic impact on relieving fiber's disintegration by changing hydration items and lessening alkalinity of pore arrangements in bond. Connections between's bond hydration and fiber corruption show that both mineralization and soluble base hydrolysis of characteristic fiber can be significantly alleviated through this technique.

"Degradation mechanisms of natural fiber in the matrix of cement composites" (2015), Jianqiang Wei , Christian Meyer, Cement and Concrete Research 73 (2015) 1–16

The debasement components of normal fiber in the antacid and mineral-rich condition of concrete lattice are explored. Bond hydration is exhibited to be a vital factor in understanding fiber corruption conduct by outlining a complexity test to install sisal filaments in unadulterated and metakaolin adjusted concrete grids. Notwithstanding toughness of sisal fiber-strengthened bond composites controlled by methods for flexural properties, corruption level of the inserted strands is specifically assessed by proposing a novel detachment approach. The outcomes

demonstrate that, by decreasing alkalinity of pore arrangement, metakaolin successfully mitigates the disintegration of characteristic fiber. By joining aftereffects of thermo-gravimetric investigation and microstructure, the salt corruption procedure of characteristic fiber, which comprises of hydrolysis of lignin and hemicellulose, stripping of cellulose microfibrils and crumbling of nebulous areas in cellulose chains, is outwardly introduced. Two new ideas of mineralization system, calcium hydroxide (CH)-mineralization and self-mineralization, are additionally proposed and quantitatively portrayed.

"Compressive behaviour of fibre-reinforced cemented paste backfill" (2015), X.W. Yi, G.W. Ma, A. Fouri, Geotextiles and Geomembranes 43 (2015) 207e215

Fortification of established glue inlay (CPB) with polypropylene strands was examined as a method for enhancing the solidness of refilled underground mine stopes. A progression of unconfined compressive quality (UCS) tests were done on both non-strengthened and fiber-fortified established tailings. Sandy residue tailings from a nickel mine in Western Australia were utilized as a part of the examination. Normal Portland concrete at convergences of 3e5% by weight of tailings and 0e0.5% Adfil-Ignis polypropylene filaments by weight of aggregate solids were utilized for example planning. The pressure strain bends from the UCS tests demonstrated the consideration of filaments expanded the UCS and altogether lessened the post top quality misfortune. As needs be, the fiber-fortified examples were observed to be substantially more bendable than unreinforced examples, which is very alluring in numerous inlay applications. Cut pictures procured from X-beam registered tomography (CT-examine) exhibited that the watched bendable conduct of strengthened examples could be disclosed by the restriction to split development gave by the activated fiber rigidity. Everywhere strains, fiber-fortified examples had basically zero removed parts and held their honesty as appeared in both exploratory photographs and CT cut pictures.

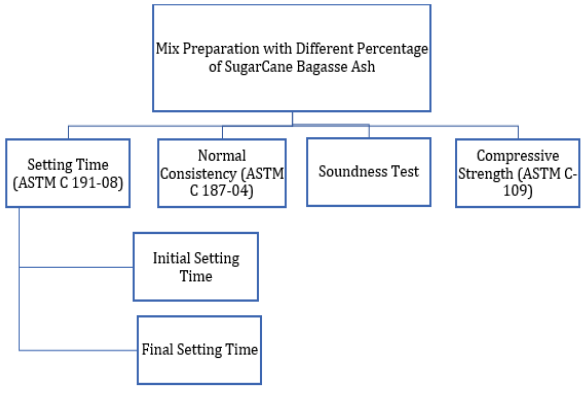

Figure 1.2 Process Flow Chart for Cement Mortar

This was unique in relation to unreinforced examples, which grew substantial, wide breaks that brought about cracking of the tried examples. The potential for enhancing the self-supporting limit of the fill mass utilizing fiber strengthening however less concrete is talked about and potential points of interest, for example, diminished mineral weakening while uncovering contiguous stops are examined.

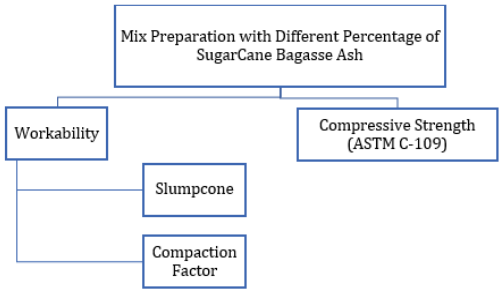

Figure 1.3 Process Flow Chart for Cement Concrete

3. CONCLUSION

The use of Sugarcane Bagasse Ash as a partial replacement of cement, especially at low percentages of replacement, is promising. This study investigated the behaviour of cement concrete and mortar after using Sugarcane Bagasse Ash waste. It can be concluded

For Cement Mortar

- The initial setting time considerably decreases with the partial replacement of cement by Sugarcane bagasse ash. However, final setting time is slightly lower for blended cement paste as compared to the ordinary cement paste.
- It is obvious from the study that the normal consistency of the cement paste containing different percentage of Bagasse ash is going to increase as the percentage of Bagasse ash increases.

And for Cement Concrete

- The study show that by increasing the sugarcane bagasse ash in the cement concrete there is increment in workability.

REFERENCES

[1] Ashok Pandey, Carlos R. Soccol , Poonam Nigam, Vanete T. Soccol "Biotechnological potential of agro-industrial residues. I: sugarcane bagasse" (2000), Bioresource Technology 74 (2000) 69±80

[2] Asad Hanif, Pavithra Parthasarathy, Hongyan M, Tianyuan Fan , Zongjin Li "Properties Improvement of Fly Ash Cenosphere Modified Cement Pastes Using Nano Silica" (2017), doi: 10.1016/j.cemconcomp.2017.04.008.

[3] Babak Koohestani, Bruno Bussière, Tikou Belem, Ahmed Koubaa ,"Influence of polymer powder on properties of cemented paste backfill", International Journal of Mineral Processing (2017), doi: 10.1016/j.minpro.2017.07.013

[4] Bangar Sayali S.,Phalke Shubhangi N. ,Gawade Anjali Y.,Tambe Rutuja S. & RahaneA. B. 2017, "a Review Paper on Replacement of Cement

with Bagasse Ash", International Journal of Engineering Sciences &Management
[5] Ertug Aydin, "Data for the physical and mechanical properties of staple fibers cement paste composites" Data in Brief14 (2017)307–312
[6] Everton Jose da Silva, Maria Lidiane Marques, Fermin Garcia Velasco, Celso Fornari Junior, Francisco Martínez Luzardo, Mauro Mitsuuchi Tashi, "A new treatment for coconut fibers to improve the properties of cement based composites – Combined effect of natural latex/pozzolanic materials" (2017), Sustainable Materials and Technologies 12 (2017) 44–51
[7] J Paya, J Monzo, MV Borrachero, L Dıaz-Pinzon and LM Ordo´n, (2002), "Sugar-cane bagasse ash (SCBA): studies on its properties for reusing in concrete production",
[8] JianqiangWei, Christian Meyer, "Degradation of natural fiber in ternary blended cement composites containing metakaolin and montmorillonite," Corrosion Science http://dx.doi.org/10.1016/j.corsci.2016.12.004
[9] JianqiangWei, Christian Meyer "Degradation mechanisms of natural fiber in the matrix of cement composites" (2015), Cement and Concrete Research 73 (2015) 1–16
[10] K. Korniejenko , E. Frczek, E. Pytlak, M. Adamski, "Mechanical properties of Geopolymer composites reinforced with natural fibers" (2016) International Conference on Ecology and new Building materials and products, ICEBMP 2016, Procedia Engineering 151 (2016) 388 – 393
[11] Lesa Brown, Florence Sanchez, "Influence of carbon nano-fiber clustering on the chemo-mechanical behaviour of cement pastes", (2016), http: // dx.doi.org /10.1016 / j. cemconcomp. 2015.10.008
[12] Mahsa Kamali, Ali Ghahremaninezhad, "An investigation into the influence of superabsorbent polymers on the properties of glass powder modified cement pastes", (2017), Construction and Building Materials 149 (2017) 236–247
[13] M. Rupasinghe, R. San Nicolas, P. Mendis, M. Sofi, T. Ngo, "Investigation of strength and hydration characteristics in nano-silica incorporated cement paste", Cement and Concrete Composites (2017), doi: 10.1016/j.cemconcomp.2017.02.011
[14] Manuel Hambach , Hendrik Möller , Thomas Neumann, Dirk Volkmer, "Portland cement paste with aligned carbon fibers exhibiting exceptionally high flexural strength (N 100 MPa)" (2016), Cement and Concrete Research 89 (2016) 80–86
[15] Marwan Mostafa, Nasim Uddin, "Experimental analysis of Compressed Earth Block (CEB) with banana fibers resisting flexural and compression forces", (2016), Case Studies in Construction Materials
[16] Mathialagan Sumesh, U. Johnson Alengaram , Mohd Zamin Jumaat, Kim Hung Mo, Mohammed Fouad Alnahhal, "Incorporation of nano-materials in cement composite and Geopolymer based paste and mortar – A review", (2017), Construction and Building Materials 148 (2017) 62–84
[17] Ming Li a, Song Zhou, Xiaoyang Guo, "Effects of alkali-treated bamboo fibers on the morphology and mechanical properties of oil well cement", (2017), Construction and Building Materials 150 (2017) 619–625
[18] N. B. Singh, V. D. Singh and Sarita Rai, 2000. "Hydration of Bagasse Ash-Blended Portland Cement", Journal of Cement and Concrete Research 30, p. 1485
[19] Prashant O Modania, M R Vyawahare, "Utilization of Bagasse Ash as a Partial Replacement of Fine Aggregate in Concrete", 2013, Procedia Engineering 51 (2013) 25 – 29
[20] Ravil Z. Rakhimov, Nailia R. Rakhimova, Albert R. Gaifullin and Vladimir P. Morozov, "Properties of Portland cement pastes enriched with addition of calcined marl", Journal of Building Engineering, http://dx.doi.org/10.1016/j.jobe.2017.03.007
[21] Sharaf Alkheder, Yasmeen T. Obaidat ,Madhar Taamneh "Effect of olive waste (Husk) on behaviour of cement paste" (2016), Case Studies in Construction Materials 5 (2016)19–25
[22] Standard Test Method for Normal Consistency of Hydraulic Cement American Association State Highway and Transportation Officials Standard AASHTO No.: T 129
[23] Standard Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency, American Association State Highway and Transportation Officials Standard AASHTO No.: T162
[24] Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle, American Association State Highway and Transportation Officials Standard AASHTO No.: T131, Designation: C191 – 08
[25] Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading), Designation: C 78 – 02
[26] Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens), Designation: C 109/C 109M – 07
[27] Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens, Designation: C 39/C 39M – 03
[28] Urkhanova Larisaa, Lkhasaranov Solbona , Buiantuev Sergeib, "Fiber-reinforced concrete with mineral fibers and nanosilica" (2017) 18th International Conference on Rehabilitation and Reconstruction of Buildings 2016, CRRB 2016, Procedia Engineering 195 (2017) 147 – 154
[29] Urkhanova Larisaa, Lkhasaranov Solbon, Buiantuev Sergei, "Fiber-reinforced concrete with mineral fibers and nano-silica", (2017), 18th International Conference on Rehabilitation and Reconstruction of Buildings 2016, CRRB 2016
[30] Valeria Corinaldesi, Alessandro Nardinocchi, "Influence of type of fibers on the properties of high performance cement-based composites" (2016), Construction and Building Materials 107 (2016) 321–331
[31] X.W. Yi, G.W. Ma, A. Fouri "Compressive behaviour of fibre-reinforced cemented paste backfill" (2015), , Geotextiles and Geomembranes 43 (2015) 207e215
[32] Xiangyu Li , Yan Ming Liu, Wen Gui Li , Chen Yang Li , Jay G. Sanjayan , Wen Hui Duan , Zongjin Li, "Effects of graphene oxide agglomerates on workability, hydration, microstructure and compressive strength of cement paste", (2017), Construction and Building Materials 145 (2017) 402–410
[33] Yue Li, Hui Lin, Zigeng Wanga, "Quantitative analysis of fly ash in hardened cement paste", (2017) Construction and Building Materials 153 (2017) 139–145.