STUDY ON M-SAND IN SELF COMPACTING CONCRETE OF M20 GRADE WITH ADDITION OF GLASS FIBER – A REVIEW

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ABSTRACT:
Concrete is the most basically used material in the advancement of development field took after by steel as fortification similarly, the Self compacting concrete is utilized where it could settle by its own particular weight. The present-day circumstance is seeing a speedy change in the building material industry and well-ordered new advances are supplanting the customary used materials. Notwithstanding, fiber may fill in as a super plasticizer admixture which can likewise result to solid’s lessening of water assimilation, more noteworthy power so Tec-Mix 550 is utilized as the super plasticizer with the goal that workability could be expanded after expansion of Fibers. By alluding the diary papers, the examination which has been performed by them to decide the better measurements for the admixtures and then observe the effect of over dose of the prominent admixtures has been considered. This flexible having a place of the diverse fiber and polymer fortified in bond solid blend may moreover deliver better quake protection of the building or shape as it redirects for some time in light of the fact that the heap is executed and afterward comes back to its unique part on the grounds that the heap is wiped out. This paper diagrams about the analyses done on concrete with glass strands and a favored solid mix being the oversee association. The Glass filaments are not being supplanted they have recently been included additional according to their percentages. The examples formed have been cured and tried to compressive power at the seventh and 28th days subsequent to curing.

Keywords: Glass fibers, Super plasticizer, Self-compacting concrete

1. INTRODUCTION:
Concrete a building material crafted from a mixture of damaged stone or gravel, sand, cement, and water, which may be unfold or poured into moulds and paperwork a stone-like mass on hardening. It is the maximum widely used manufacturing fabric in international. So, it is vital to recollect the sturdiness of concrete indirect of financial machine, serviceability, and upkeep. The concrete is long lasting way it need to stand up to the chemical aggression, mechanical and weathering movement without any lack of power, and deterioration at some stage in their anticipated service life. Concrete isn't fully resistance to acids is the number one hassle of sturdiness. The long-lasting concrete shape calls for proper enough compaction and putting. In congested reinforcement regions the compaction and setting are very tough.

1. SELF-COMPACTING CONCRETE
Self-Compacting Concrete (SCC) can be compacted into every corner of the shuttering, due to its own weight there is no need for additional vibration. The importance of self-compacting concrete is that maintains all concrete’s durability and characteristics, meeting expected performance requirements.
1.2 SUPER PLASTICIZER (TEC-MIX550)

The super plasticizer is used in Self compacting concrete because the addition of the glass fibers will decrease the work ability. The addition of Tec-Mix will regain the work ability needed for the Self Compacting Concrete.

1.3 Glass Fibers

Glass filaments are among the most flexible modern materials known today. They are promptly created from crude materials, which are accessible in basically boundless supply. All glass filaments depicted in this article are gotten from organizations containing silica. They show accommodating mass properties, for instance, hardness, straightforwardness, insurance from compound of attack, strength, and inertness, and furthermore alluring fiber properties, for instance, quality, flexibility, and solidness. Glass strands are used as a piece of the make of fundamental composites, printed circuit sheets and a broad assortment of remarkable reason thing. Glass fibers fall into two classes, ease extensively valuable strands and premium exceptional reason fibers. More than 90% of all glass strands are broadly useful items. These strands are known by the assignment E-glass and are liable to ASTM details. The rest of the glass filaments are premium extraordinary reason items. Many, similar to E-glass, have letter assignments suggesting uncommon properties.

2. Literature Review

Savanna et al., (2010) has outlined an experimental investigation on flexural behavior of glass fiber reinforced self-compacting concrete slabs numerous tries had been made inside the recent years on research at the conduct of undeniable SCC. But, just a few tries were made on the conduct of structural elements fabricated from SCC. Additionally, numerous studies inside the beyond have discovered the usefulness of the metallic fibers to enhance the structural homes of concrete like ductility, publish crack resistance, power absorption capability etc. An attempt has been made inside the investigation stated on this paper to observe the effect of glass fibers on glass fiber bolstered self-compacting concrete using Alkali Resistant glass fibers at the electricity and behavior of fiber bolstered SCC structural factors subjected to flexure for various grades of concrete mixes of M 30, M 40.

OrodZarrinkafsh et al., (2016) they did and review on The Investigation of Fiber Reinforcement Self-Compacting Concrete and Fiber Reinforcement Concrete. From the gathered information done on Fiber Reinforcement Self-Compacting Concrete (FRSCC) which has the ability to two rise fields, surface service ability and the mechanical rheology. The mechanical issue of FRSCC had been examined to offer the prototype models of shear and flexure potential, versatile or compressive quarter data. The traits of FRC are determined with the aid of put-up-cracking conduct and FRSCC is managed through SCC workability. By using FRSCC the costs and creation length lessen significantly and its potential to place irregular segment in terms of congestion of stirrups and bars and thin segment is every other wonderful thing.

Prof. Aijaz Ahmad Zende et al., (2014) they did review and an Overview of the Properties of Self Compacting Concrete. This Paper evaluates the latest research which had been performed on Self Compacting Concrete (SCC) and evaluate it with regular Concrete (NC). Nearly all international locations inside the international are facing an acute decline within the availability of skilled exertions in the production enterprise, and hence the need of unique Concretes will become very critical on this global wherein the usage of concrete is just next to the water.

ShahanaSheril P.T. G housia (2013) has done an experiment on Self-Compacting Concrete Using Fly Ash and Glass Fiber Self-compacting concrete is a fairly invention in concrete and the addition of fibers to it suggests increased strength homes. Numerous studies have been finished on self-compacting concrete with fiber addition. in this work, a strive has been made to make a comparative look at the sparkling and hardened kingdom residences of M20 and M30 grades of concrete mixes of self-compacting concrete(SCC).

RBharathiMurugan et al., (2017) has done a experiment on Influence of Glass Fiber on Fresh and Hardened Properties of Self Compacting Concrete The reasonable need of self-compacting concrete (SCC) is developing a result of the foundation ability everywhere throughout the world. The effective method for expanding the vitality of cement and enhance the lead underneath inordinate stacking (hearth) is the
enthusiastic interest. Glass fibers had been introduced for 5 distinctive of quantity fractions (0%, 0.1%, 0.3%, 0.5% and 0.6%) to decide the ultimate percent of glass fiber without compensating the fresh properties and more advantageous hardened properties of SCC concrete. The sparkling state of concrete is characterized by way of stroll flow, T-50cm droop waff, and V-funnel and L- box exams. The effects obtained in sparkling nation are in comparison with the acceptance criteria of EFNARCC specification.

M. Chandrasekhar et al., (2012) they did an experiment on Structural behavior of glass fiber reinforced self-compacting concrete wall panels this paper outlines that Fiber strengthened Self Compacting Concrete (FRSCC) is developing as ventured forward basic texture with better mechanical homes of higher youthful's modulus, expanded compressive quality, break protection and sturdiness. The current investigations are intended for know-how the impact of mechanical quality places of FRSCC the use of glass filaments. On this look at anti-crack excessive dispersion glass fibers with component ratio of 857 are used in M30 grade Self Compacting Concrete (SCC) with a dosage of 0.60kg/m3. The strain-pressure conduct of Glass Fiber bolstered Self Compacting Concrete (GFRSCC) changed into investigated on well-known cylinders of 150mm x three hundred mm and mathematical models within the shape of polynomial equations were developed.

Hajime Okamura et al., (2003) did an experimental investigation on Self-Compacting Concrete. In this paper research were carried out to obtain a rational blend design approach and checking out Method for self-compacting concrete so that you can make it a fashionable concrete instead of a unique concrete. They proposed a simple blend layout by means of keeping the coarse and exceptional aggregate content material constant, adjusting the water powder ratio and top-notch plasticizer dosage to gain self-compatibility. acceptance check of the self-compacting concrete turned into finished by checking its glide thru the trying out apparatus.

Rama Prasad Reddy et al., (2014) they did an experiment on the effect of glass fiber on mechanical properties of vibrated concrete and self-compacting concrete. Overall performance of civil engineering structures to an amazing quantity depends at the characteristics of the substances used for his or her construction. Innovation in construction is particularly connected with development of superior production substances. Fiber strengthened concrete can offer a handy, practical and not pricey method for overcoming micro-cracks and comparable kind of deficiencies.

T. Meena (2016) did an Investigation of Hybrid Fiber Reinforced Self-Compacting Concrete Beam-Column Joints with and without Ductile Detailing and this paper states that Self-Compacting Concrete (SCC) is one of the special kind of concretes, able to flow freely of its own and filling the shape-paintings without the need for vibration. This superior exceptional of SCC permits reduction in various types of pollutants which includes noise, utilization of fossil gasoline concerned in cement manufacture, intake of cement itself via manner of including sustainable materials as mineral admixtures, etc. The by means of-products received from diverse industries are doubtlessly utilized in concrete-making, accordingly serving as a means of their disposal too.

H S Jadhav et al., (2016) they did an experimental investigation on residual compressive strength of self-compacting concrete using fibers under elevated temperature where Fiber bolstered concrete is geometry made from glass, glass or herbal fiber. In current years, Self-Compacting Concrete (SCC) has received huge use for placement in congested reinforced concrete systems with difficult casting conditions. SCC is essentially advanced to clear up issues of pouring and setting concrete in excessive rebar densities systems.

Mr. Manohar K N et al., (2013) this paper outlines about the Strength Characteristics of Glass Fiber Reinforced Self-Compacting Concrete with Fly Ash and Silica Fume where Self-compacting concrete (SCC) is a concrete that has a high flowing ability with no segregation. it is one of the innovative traits in concrete generation in recent times. It reduces noise at websites, precast manufacturing facility and community. Self-compacting concrete and glass
fibers are combined to create glass fiber bolstered self-compacting concrete

**Jatin Arora (2015)** an investigation on glass fibre reinforced concrete for construction the assessment dynamically signifies the numerous additives and characteristics indulged within the evaluation of Glass Fiber reinforced Concrete. Fundamentally, GFRC is a fiber-based concrete in which fiber are uniformly allotted and partly orientated in conjunction with other cloth inclusive of cement, aggregates, sand, water, fly ash, etc. those fibers reinforce the concrete internally.

**Isuru et al., (2017)** this paper outlines an experimental investigation on the Flexural behavior of glass fiber-reinforced polymer and ultra-high-strength fiber-reinforced concrete composite beams subjected to elevated temperature. Composite beams along with pultruded glass fiber-bolstered polymer (GFRP) I-beams and extremely-high-electricity fiber-reinforced concrete (UFC) slabs had been evolved to be used in quick-span bridges. Fiber-bolstered polymer bolts (fiber-strengthened polymer threaded rods) and epoxy adhesive had been used to attach the UFC slab to the GFRP I-beam. The authors performed material exams and large-scale static bending checks at room and expanded temperatures (much less than 90°C) to research the flexural conduct of GFRP-UFC composite beams subjected to multiplied temperature. The take a look at results demonstrated that the mechanical houses of the GFRP I-beams, fiber-bolstered polymer bolts and epoxy adhesive have been significantly deteriorated at extended temperatures because of the glass transition in their polymer resin matrices. As a result, the stiffness and last flexural capacity of the GFRP-UFC composite beams beneath expanded temperatures were considerably reduced.

**Deepak Raj et al., (2016)** they did a project on Experimental Methods on Glass Fiber Reinforced Self Compaction Concrete and this paper concludes that Self Compacting Concrete (SCC) is about how much it is capable of flowing underneath its own weight and how completely it fills the formwork, even inside the presence of congested reinforcement, without any compaction, while maintaining a homogeneity of the concrete. Compaction is tough to be performed in conditions whereas there are dense reinforcement and massive casting location. Utilization of SCC will conquer the hard casting conditions and reduce manpower required because of its ability in settling with its own weight. Addition of fibers will beautify the tensile and ductile conduct of concrete with brittle nature. SCC become added with enormously brief, discrete, and discontinuous glass fibers to provide Glass Fiber bolstered Self Compacting Concrete (GFRSCC).

**A Conforti et al., (2017)** they had done an experimental investigation on the fiber orientation (Vibrated and self-compacting fiber reinforced concrete). Similarly, to the fiber kind and content, the residual properties of fiber bolstered concrete are influenced by using fiber orientation. consequently, the performance fiber strengthened concrete may be suffering from its sparkling properties (workability, flowing potential) and by means of casting and compaction strategies adopted. This paper specializes in the take a look at of the orientation of glass or macro-synthetic fibers in two substances characterized by using very exceptional sparkling residences: vibrated and self-compacting concrete.

**ASHOK P G et al., (2009)** they did an investigation on the fiber reinforced self-compacting concrete using ggbs and metakaolin. A whole lot studies has been done on workability and mechanical properties of self-compacting concrete. This studies goal to locate workability and mechanical residences of Glass fiber bolstered self-compacting concrete on sparkling and hardened kingdom using mineral admixture floor granulated blast furnace slag and metakaolin the use of varying in percentage of glass fiber from approximately 0% to 0.5% with about 6mm and 12mm duration of glass fiber with the aid of weight of concrete with 0.8% of superplasticizer

**CONCLUSION:**

In this paper study about the half of river sand is replacement by m-sand and by adding the steel fiber in self compacting concrete has been investigated. The experimental investigation is based on tests of fresh concrete tests and compression test Hence the following conclusions are derived from this study. By adding the Glass fiber in the self-compacting concrete with higher percentage increases the compressive strength of the concrete. It can be avoid cracks and gives high durability. Obtained strength of River sand is higher than the M-sand. But the
Strength of M-Sand is higher than the Required level.

REFERENCES:

- The investigation of fiber reinforcement self-compacting concrete and fiber reinforcement concrete. Reviewed by orodzarrinkafsh*, Mohesen Ramezan shirazi, Hassan moniri and Mohammad moniri.(2016) ISSN: 2165-784X JCEE, an open access journal Volume 6 • Issue 2 • 1000218
- Self-compacting concrete using fly ash and glass fibre shahana sheril p.t. Ghousia college of engineering, ramnagaram, karnataka. ISSN:2278-0181 Vol 2 issue 9 Sept 2013
- Influence of glass fiber on fresh and hardened properties of self-compacting concreter bharathi murugan1, m k haridharan2, c natarajan3 and r jayasankar3 IOP Conf. Ser.: Earth Environ. Sci. 80 012004 (2017)
- Investigation on residual compressive strength of self-compacting concrete using fibres under elevated temperature h s jadhav1 and a s patharwat1* ISSN 2319 – 6009 Vol 2, No. 3, August 2013
- Strength characteristics of glass fiber reinforced self-compacting concrete with fly ash and silica fume 1, mohanal k n, mr. Srishalia j m, pr. Prakash p, dr. Prema kumar w p ISSN:2278-0181 Vol4, Issue8, Aug- 2015
- Glass fibre reinforced concrete for construction – a review sakshi gupta, abhimanyu ramola, anand saini, jatin arora, aakash ISSN:2278-0181 Vol6, Issue7, July- 2017