Abstract: Concrete could be a versatile broadly used construction material. Since concrete remains recognized as being a material for construction, scientists are really attempting to enhance its quality and enhance its performance. Recent adjustments to construction industry demand enhanced sturdiness of structures. There’s a methodological alternation in the concrete design within the strength based concept having a performance based design. At this time there’s a big focus on performance a part of concrete. A specific thought has brought to the introduction of Self Compacting Concrete (SCC). It’s called “the most revolutionary rise in concrete construction”. SCC could be a new type of High Finish Concrete (HPC) with excellent deformability and segregation resistance. It could flow through and fill the gaps of reinforcement and corners of moulds with no dependence on vibration and compaction with the placing process. The guiding principle behind self-compaction is the fact “the sedimentation velocity in the particle is inversely proportional for that viscosity within the floating medium where the particle exists”. Another highlights of mix proportion of SCC include low water to cementations material ratio, large amounts of powder, high paste to aggregate ratio and fewer amount of coarse aggregate. Among the generally employed techniques to produce Self Compacting Concrete is to use fine materials like Fly Ash, GGBFS etc in concrete, besides cement, the concept being to boost powder content or fines in concrete. The very first contribution in SCC pertains to the pioneering work of Nan Su et al who've created a simple mix design methodology for Self Compacting Concrete. During this method, the quantity of aggregate needed is made a decision first, according to Packing Factor (PF). This might make sure that concrete acquired has good flowability, self compacting ability along with other preferred SCC qualities. The Eu Federation of Producers and Applicators of Specialist Items for Structures (EFNARC) [2005] offer set certain methods for fresh qualities of SCC. The current analysis concentrates at developing high strength Self Compacting Concrete of M40 and M70 Grade. The parameters of study include grade of concrete and aftereffect of size aggregate. The present Nan Su [2001] approach to mix design needed it's origin from packing factor for the caliber of concrete, acquired and used according to the requirement. SCC qualities for example flowability, passing ability and segregation resistance tend using slump flow, L box and V funnel tests.

I. INTRODUCTION

The flexibility and taking advantage of concrete within the construction industry need not be emphasized. Research on normal and strength concrete remains across the agenda greater than two decades. According to IS: 456 - 2000[Code of Practice for Plain and Elevated Concrete], concretes different 25 - 55 MPa are called standard concretes while people above 55 MPa may be referred to as high strength concrete. Concretes above 120/150 MPa are called ultra high strength concrete. High strength concrete is loaded with lots of programs worldwide in tall structures, bridges with extended span and structures in aggressive conditions. Building elements created from high strength concrete are often densely elevated. This congestion of reinforcement results in serious problems while concreting. Densely elevated concrete problems may be solved by using concrete which can be easily placed and spread among the overloaded elevated concrete elements. A very homogeneous, well spread and dense concrete may be ensured using this kind of kind of concrete.

Self-compacting concrete (SCC) could be a concrete, which flows and compacts only under gravity. It fills the mould completely with no defects. Usually self-compacting concretes havepressive talents in most the various 60-100 N/mm². However, lower grades may also be acquired and used according to the requirement. SCC was created in the college of Tokyo, Japan, Japan, Japan in Japan using leading concrete companies during 1980’s to obtain mainly helpful for highly overloaded elevated structures in seismic regions. As sturdiness of concrete structures was an essential issue in Japan, an sufficient compaction
by skilled labors was needed to get durable concrete structures. This requirement brought to the introduction of SCC.

**MATERIALS**

Cement: Ultra Tech Cement
Coarse aggregate: 20mm, 12.5mm, 10mm Collected From Keesara
Microsilica: Collected From Mumbai
Fly Ash: Collected From Ktps
Super Plasticizer: Glenium Collected From Ultra Tech Ready Mix
Viscosity Modifying Agent (Vma): Glenium Stream-2 Ultra Tech Ready Mix

**Test Methods**

Tests on cement, fine aggregate, coarse aggregate:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Property</th>
<th>Test Method</th>
<th>Test Results</th>
<th>IS Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal Consistency</td>
<td>Vicat Apparatus (IS: 4031 Part - 4)</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Specific gravity</td>
<td>Sp. Gr bottle (IS:4031 Part - 4)</td>
<td>3.03</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Initial setting Time</td>
<td>Vicat Apparatus (IS: 4031 Part - 4)</td>
<td>96 minutes</td>
<td>Not less than 30 minutes</td>
</tr>
<tr>
<td></td>
<td>Final setting time</td>
<td></td>
<td>207 Minutes</td>
<td>Not less than 10 hours</td>
</tr>
<tr>
<td>4</td>
<td>Fineness</td>
<td>Sieve test on sieve no.9 (IS: 4031 Part – 1)</td>
<td>1.3%</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S. No</th>
<th>Property</th>
<th>Method</th>
<th>Fine Aggregate</th>
<th>Coarse Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>20mm</td>
<td>10mm</td>
</tr>
<tr>
<td>1.</td>
<td>Specific gravity</td>
<td>Pycnometer IS:2386 Part 3-1986</td>
<td>2.54</td>
<td>2.89</td>
</tr>
<tr>
<td>2.</td>
<td>Bulk</td>
<td>IS:2386 Part 3-1986</td>
<td>6% w c</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>Bulk density</td>
<td>--</td>
<td>1.46g/cc</td>
<td>1.41g/cc</td>
</tr>
<tr>
<td>5.</td>
<td>Percentage of void</td>
<td>--</td>
<td>38%</td>
<td>50.1%</td>
</tr>
</tbody>
</table>

It absolutely was observed that no test approaches for SCC has yet been standardized, nor the tests described are yet perfected or definitive. A brief description in the tests remains presented below. They are mainly ad-hoc techniques, which have been devised designed for SCC.

**Slump flow make certain T50 cm test**

The slump flow may be used to assess the horizontal free flow of SCC without obstructions. It had been initially created in Japan for use in assessment of under water concrete. The diameter in the concrete circle can be a method of calculating the filling ability of concrete.

Slump Flow is unquestionably most likely probably the most generally used SCC tests right now. This test involves using slump cone with conventional concretes as described in ASTM C 143 [Standard Test Method of Slump of Hydraulic-Cement...
Concrete]. The main among Slump Flow Make certain ASTM C 143 [Standard Test Method of Slump of Hydraulic-Cement Concrete] is the Slump Flow Test measures multiplication or flow of concrete sample, once the cone is lifted instead of the traditional slump (visit height) in the concrete sample. The T50 test may also be determined through the Slump Flow Test. It is simply how lengthy the concrete requires to circulate with a diameter of fifty centimeters.

**L – Box test**

This test, with various Japanese the thought of underwater concrete, remains described Petersson, 1999. This test assesses the flow of concrete, along with the extent it's uncovered to obstructing by reinforcement. The various tools is proven in figure.

The various tools features a rectangular-section box exactly the same shape being an ‘L’, getting a vertical and horizontal section, separated having a moveable gate, before which, vertical measures of reinforcement bars are fitted. The vertical section is full of concrete, so the gate is lifted to permit the concrete flow to the horizontal section. When the flow has stopped, the height in the concrete within the finish in the horizontal section is expressed just like a proportion of the dwelling within the vertical section referred to as as $H_2/H_1$ ratio or obstructing ratio. It signifies the slope in the concrete when the concrete reaches relaxation. It becomes an indication of passing ability, or perhaps the degree the passage of concrete using the bars is bound.

**V – funnel test**

This test was created in Japan and utilized by Ozawa et al. [1989]. The tools includes a V-produced funnel. The V-funnel test enables you to look for the filling ability within the concrete getting the best possible aggregate size 20mm. The funnel was full of about 12 litre of concrete along with the time taken with this particular to circulate while using apparatus measured. Following this the funnel was refilled concrete and left for five minutes to stay. When the concrete shows segregation your flow time increases considerably.

**Curing of test good examples**

After 48 hrs of casting, the great good examples were removed the moulds and immediately drizzled with clean freshwater. The great good examples were healed for any couple of days, seven days and 4 days correspondingly according to the requirement old of curing. The freshwater tanks helpful for that curing within the good good examples were purged and washed once in every 15 days and were filled once more.

All of the good good examples under immersion were always stored well under water and it also was observed that no under about 15 cm water was outrageous good good examples.

**Tests on hardened concrete**

Testing of hardened concrete plays an important role in controlling and confirming the quality of self compacting concrete.

**Compressive Strength**

Compressive strength of a material is defined as the value of uniaxial compressive stress reached when the material fails completely. In this investigation, the cube specimens of size $150 \text{ mm} \times 150 \text{ mm} \times 150 \text{ mm}$ are tested in accordance with IS: 516 – 1969 [Method of test for strength of concrete]. The testing was done on a compression testing machine of 300 tons capacity. The machine has the facility to control the rate of loading with a control valve. The machine has been calibrated to the required standards. The plates are cleaned; oil level was checked and kept ready in all respects for testing.

After 28 days of curing, cube specimens were removed from the curing tank and cleaned to wipe off the surface water. The specimens were transferred on to the swivelling head of the machine such that the load was applied centrally. The smooth surfaces of the specimen are placed on the bearing surfaces. The top plate was brought in contact with the specimen by rotating the handle. The oil pressure valve was closed and the machine was switched on. A uniform rate of loading $140 \text{ kg/cm}^2/\text{min}$ was maintained. The maximum load to failure at which the specimen breaks and the pointer starts moving back was noted. The test was repeated for the three specimens and the average value was taken as the mean strength. In the present investigation, the compressive strength test has been conducted on concretes with different sizes of coarse aggregate. M 40, M70 grades of SCC at 3, 7 and 28 day were tested.
II. OBJECTIVES WITHIN THE WORK

Despite its advantages and versatile nature, SCC has not acquired much recognition in India, climax been broadly promoted within the center East within the last 2 decades. Knowledge of SCC has spread around the globe, motivated by concerns with poor consolidation and sturdiness just just just in case of typically vibrated normal concrete. To check out of aftereffect of techniques big aggregate on the effectiveness of Self compacting concrete by utilizing IS design procedure when per Efnnaar Specifications. Endemic programs of SCC are actually restricted due to inadequate standard mix design procedure and testing techniques. Materials: Sand, coarse aggregate, mineral and chemical admixtures. The dangerous chemicals present in our analysis have commercial grade. Cement: Ordinary Portland cement of 53 grades was applied inside the study. It absolutely was acquired in one source and stored. Care remains arrived at make certain the cement of same company and same grade may be used while using analysis. Fine Aggregates: The fine aggregate used was where you live available river sand without any organic dangerous pollutants and conforming. The fine aggregate was examined due to its physical needs for instance gradation, fineness modulus, specific gravity and bulk density. Coarse Aggregate: The rounded and smaller sized sized aggregate pollutants have better flow ability and deformability of concrete furthermore to prevent segregation. Graded aggregate may also be important particularly to cast concrete in highly overloaded reinforcement or formwork getting small dimensions. Crushed granite metal of dimensions 16 mm to 10 mm graded acquired within the where you live available quarries was applied within our analysis. Water: Water useful for mixing and curing was potable water, which was free from any amounts of oils, chemicals, alkalis, sugar, salts and organic materials or other substances which can be unhealthy to concrete or steel verifying. The solids present were within the allowable limits. Fly Ash: Fly ash is considered the most extensively used extra cementations materials inside the construction field resembling Portland cement. Most of the fly ash pollutants are solid fields plus a number of pollutants, recognized to as ecospheres, are hollow plus a number of will be the plerospheres which are fields which includes smaller sized sized sized sized fields inside. Fly ash is mainly silicate glass which includes silica, alumina, iron, and calcium. The relative density or specific gravity of fly ash generally ranges between 1.9 and a pair of.8 combined with the color are often grey. Super Plasticizer: High range water reducing admixture recognized to as super plasticizers may be used improving the flow or workability for lower water-cement ratios without sacrifice inside the compressive strength. Within
our work, water-reducing admixture was applied. Viscosity Modifying Agent: These admixtures boost the viscosity water and eliminate the bleeding and segregation phenomena inside the fresh concrete whenever achievable. VMA might be a neutral, biodegradable, liquid chemical additive designed to lessen the bleeding, segregation, shrinkage and cracking obtainable in high water/cement ratio concrete mixes. VMA also result in stabilization for SCC mixes that will probably segregation at high slump ranges.

III. SUGGESTED MIX PROPORTIONING

Batching And Mixing Of SCC: The proportioning of the quantity of cement, cementations material like Fly ash, fine aggregate and coarse aggregate remains produced by weight as pointed out with the mix design [4]. Water, super plasticizer and VMA were measured by volume. All the calculating equipments are maintained inside the clean serviceable condition making use of their precision periodically checked. The blending process is moved out by hand mix. Materials are laid in uniform layers, one alternatively inside the order - coarse aggregate, fine aggregate and cementations material. Dry mixing is finished to acquire a uniform color. The fly ash is totally combined with cement before mixing. Self Compacting characteristics of fresh concrete are moved out soon after mixing of concrete using EFNARC specifications. Fresh Characteristics of SCC: Needs of Self Compacting Concrete: SCC mixes must meet three key characteristics: Capability to circulate into and completely fill intricate and sophisticated forms within unique weight, Capacity to own overloaded reinforcement within unique weight, High capacity aggregate segregation. Due to the very best powder content, SCC shows more plastic shrinkage or creep than ordinary concrete mixes. These aspects should therefore be looked at during creating and showing the SCC. Numerous test techniques are actually developed to be able to characterize the characteristics of SCC. So far, not just one way or combination of techniques has accomplished universal approval and most of them obtain enthusiasts. Similarly, not just one way continues to be seen which characterizes all the relevant workability aspects [5]. Each mix design should be examined with a couple of test method of different workability parameters. For that initial mix type of SCC the three workability parameters need to be assessed to make sure that each aspect are satisfied. An entire-scale test moved out to be certain the self-compacting characteristics inside the selected the idea of the using. For site QC, two test techniques are often sufficient to look at production quality.

IV. CONCLUSION

While using systematic and detailed experimental study moved on SCC mixes through getting a goal to build up performance mixes, listed here are the conclusions shown up. The mixes designed when using the lower size aggregate produced better fresh qualities than greater size aggregates. The effective size aggregate has decreases. As the strength of concrete increases, significant contribution within the Project: The current analysis features out clearly brought on by size aggregate across the compressive strength along with other mechanical qualities of self compacting concrete. Scope money for hard times work: The simplified mix design methodology was presented might be extended up to the more amount of concrete strength ranges. The research might be moved by helping cover their various mineral admixtures like Grain Husk Ash and GGBS aside from fly ash.

V. REFERENCES

AUTHOR’S PROFILE

B. YAMINI
B-Tech: Panineeya institute of technology and science, JNTUH 2013
M-Tech: Gurunanak institute of technology , jntuh 2014-2016

Dr. S.SREENATHA REDDY, Principal & Professor at Guru Nanak Institute of Technology under JNTUH, Hyderabad. Dr. S.SREENATHA REDDY obtained B.Tech, Mechanical Engineering from JNTU, Hyderabad, M.Tech.- Heat power, Refrigeration & Air conditioning from JNTU, Hyderabad and Ph.D. Faculty of Mechanical Engineering from JNTUA . Dr. S.SREENATHA REDDY held various administrative posts and developed the Institution with his projects and developmental activities. Notable among his awards i.e National award like Jawaharlal Nehru memorial prize for best research publication, issued Institution of Engineers on the occasion of Inauguration 27th Indian Engineering Congress at New Delhi in the year 2012 and "Bharat Vidya Shiromani Award" and a "Certificate of Education Excellence" for Outstanding Achievements in the field of Education given by International Institute of Education & management on 22 nd December 2014 at New Delhi & Glory of Education of Excellence Award is issued by IIEEM on 4th March 2015 at New Delhi. Dr. S. Sreenatha Reddy received award as Best Academic Administrator from Centre for Advanced Research and Design under Venus International Foundation on 5th July 1972.

Dr. S. Sreenatha Reddy is well known internationally for his outstanding research in Mechanical Engineering. He has also proposed a model using first principles of Thermodynamics to predict the complex Diesel Engine. In particular, he has made important contributions to the analysis and design of Internal Combustion Engine. In his work, Dr. S. Sreenatha Reddy combines modern process modeling concepts with advanced experimental techniques. He has also developed new technologies like Exhaust Gas Recirculation (EGR) and Magnetic Fuel Conditioning system for reducing harm emissions. It promotes the exchange and mutual enrichment of knowledge in international dialogue via conferences, like the Frontiers of Research Symposia and other meetings.

Dr. S. Sreenatha Reddy Earlier worked as Principal, Head of both the Aeronautical & Mechanical department, coordinating R&D cell for Mechanical Research and Development Board (MRDB) & Aeronautical Research and Development Board (ARDB) projects, TPO, NSS Coordinator, developing courseware and implementing ISO 2001 and NBA Accreditation.

Dr. S.SREENATHA REDDY published 79 International & National reputed Journals & 12 International & National Conference papers. Dr. S.SREENATHA REDDY is a member of governing body in prestigious institution of GNIT. He also served as Expert Committee Member of AICTE for scrutinizing project reports internally as well as the member in the Board of Reviewers for the Institution of Engineers journal. Also He is a Editorial Board Member of International Journal of Sciences and Engineering Technology. He is the member fellow of as many professional bodies in the field of Mechanical Engineering and Technical Education.

Prof. S.Madan Mohan received his Bachelor of Technology degree in Civil Engineering from JNTUCE Hyderabad in 1998. In 2001 he received his Master's Degree in Structural Engineering from Osmania University, Hyderabad. He joined Gurunanak Institute of Technology as a faculty where he is a Professor and Head of the Civil Engineering Department with a total experience of 17 years in field of Research, Designing and education. He is guiding M.tech Thesis work in field of Civil/ Structural Engineering. He has papers published in National Conferences and International Journals.

Associate Prof MOHAMMED ASRA JABEEN She received her Bachelor Engineering degree in Civil Engineering from Deccan College of Engineering 2012. In 2014 she received her Master's Degree in Structural Engineering from Aurora Scientific Technological and Research Academy (ASTRA), HYDERABAD.