

Study on aggregate size on strength of concrete

¹Neetu, ²Ahsan Rabbani

¹Mtech Scholar, Department of Civil Engineering, Kalinga University, Naya Raipur, Chhattisgarh, India

²Astt. Professor, Department of Civil Engineering, Kalinga University, Naya Raipur, Chhattisgarh, India

Abstract:- The material used in the construction where it is suitable for placing the concrete in difficult conditions and in structures with congested reinforcement is called High Strength Concrete. In case of unexpected fire, the concrete elements such as beams, columns etc. will be subjected to extreme temperatures and need for assessment of their performance after fire. Suites proved that it is important to understand the change in the concrete strength properties due to extreme temperature exposure. This paper shows that assessment of effect of sustained temperatures on strength properties of High Strength Concrete and its comparison with ordinary Conventional Concrete. In order to study effect of sustained elevated temperature on the compressive strength, flexural strength, tensile strength of High Strength Concrete and ordinary concrete, the specimens of the concrete which are tested in laboratory are High Strength Concrete and ordinary conventional concrete. For various tests 9 cubes (150mmX150mmX150mm), 9 cylinders were cast and same for the ordinary concrete. The results obtained were compared with the corresponding properties of normal concrete with the same water cement and air content.

Keyword: - Aggregates, ordinary Conventional Concrete, compressive strength.

INTRODUCTION

The material often used in the construction of high rise buildings and special purpose is known as concrete. Concrete in case of unexpected fire, the concrete properties are changes after fire. Show it is proved that it is important to understand the change in the concrete properties due to extreme temperature exposures. As the concrete used for special purpose, the risk of exposing it to high temperature also increases. To be able to predict the response of structure after exposure to high temperature, that is why it is essential that the strength properties of concrete subjected to high temperatures be clearly understood. Development of cracks can cause by high temperature. These cracks like any other cracks propagation may eventually cause loss of structural integrity and shorting of service life. The influence of elevated temperatures on mechanical properties of concrete is of very much important for fire resistance studies and also for understanding the behaviour of containment vessels, chimneys, nuclear reactor pressure vessels during service and ultimate conditions structures like storage tanks for crude oil, hot water, coal gasification, liquefaction vessels used in petrochemical industries, foundation for blast furnace and coke industries, furnace walls industrial chimney, air craft runway etc. will be subjected to elevated temperatures. It shows that the variations of compressive strength, performance are some of the important parameters to be investigated when concrete structures are subjected to temperatures.

LITERATURE REVIEW

Abdullah. M Civil Engineering Department, In "International Journal of Civil and Structural Engineering Volume 2, No 3, 2012. Carried out an experimental investigation on 12mm crushed Quartzite, Granite and River Gravel Aggregates Nominal mix (1:2:4) was adopted for this work and mix compositions were calculated by absolute volume method. To perform each type of coarse aggregate (150x150mm) were cast to allow the compressive strength to be monitored at 7, 14, and 28 days. The result performs shows that concrete made from river gravel has the highest workability followed by crushed quartzite and crushed granite aggregates. Highest compressive strength at all ages was noted with concrete which made from quartzite aggregate followed by river gravel and then granite aggregate.

MATERIAL USED

A material used for making concrete (cement, sand and aggregate) according to the respective IS codes were tested for their respective properties. The materials used for this experimental investigation are Cement: Ordinary Portland Cement (OPC) 43 Grade (Ultratech Cement). Using 90 micron sieve the Fineness test was done. The average value of weight of residue left on 90 micron sieve was 2.3%. The cement = 28% Initial setting time = 1 hour 53 minutes Final setting time = 5 hour 9 minutes standard consistency. Average value of expansion in Le-Chatelaine's soundness test =1.67mm. At the age of 28 days the average compressive strength =45.47 N/mm². b. Course Aggregates: A local crusher provide Course aggregates. Two nominal sizes 10mm and 20mm were used. Sieve analysis was carried out for both the sizes. Fineness modulus for 10mm aggregates = 5.9562 Fineness modulus for 20mm aggregates=8.1868 c. Fine aggregates: Local river sand was used as fine aggregates. Sieve analysis was carried out for sand. Fineness modulus of sand=3.992 (Grading Zone =II)

REFERENCES

- [1] Ian Fletcher, S. Welch and J. L. Torero (Nov. 2007) A. Mittal, M. B. Kaisare and R.G. Shetti (Jun 2004), A. Noumowe, H. Toutanji, A. Daoud
- [2] Test" American Society of Civil Engineers, Reston, pp.754-758.

- [3] person (Nov. 2004), “High Strength Concrete at Fire Temperature” Division of Building Materials, Lund Institute of Technology, Sweden, pp. 575-584.
- [4] For concrete mix design Indian standard recommended guidelines, | IS 10262: 1982, Bureau of Indian Standards, New Delhi. India.
- [5] Concrete mix proportioning - Guidelines (First revision) | IS 10262:2009, Bureau of India Standard, New Delhi, India. |
- [6] Code of practice for plain and reinforced concrete (fourth edition), IS456:2000, Bureau of India Standard, New Delhi. India.
- [7] IS: 383-1970 (Specification for coarse and fine aggregates from natural sources for concrete) | 5. Concrete technology By M.S.Shetty

