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Study on Strength and Durability Characteristics of Concrete with Waste Material in High Grade Concrete: A Review

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ABSTRACT

This gives a comprehensive review of the work carried out by various researchers in the field of using marble powder and foundry sand in concrete as full or partial replacement of aggregates, cement and additives Reinforced concrete (RC) is a compound material in which concrete comparatively low tensile and ductility are counteracted by the addition of reinforcement having higher tensile strength or ductility. The reinforcement is usually, though not necessarily, steel reinforcing bars and is usually embedded passively in the concrete before the concrete sets. Reinforcing schemes are generally designed to resist tensile in particular regions of the concrete that might cause intolerable cracking and/or structural crash. Modern reinforced concrete can contain varied reinforcing materials made of steel, polymers or alternate composite material in conjunction with rebar or not. Reinforced concrete may also be permanently stressed (in tension), so as to improve the behaviour of the final structure under working loads. In the United States, the most common methods of doing this are known as pre-tensioning and post-tensioning. Concrete is a mixture of coarse (stone or brick chips) and fine (generally sand or crushed stone) aggregates with a paste of binder material and water. When cement is mixed with a small amount of water, it hydrates to form microscopic opaque crystal lattices encapsulating and locking the aggregate into a rigid structure. The aggregates used for making concrete should be free from harmful substances like organic impurities, silt, clay, lignite etc. Typical concrete mixes have high resistance to compressive stresses (about 4,000 psi (28 MPa)); however, any appreciable tension will break the microscopic rigid lattice, resulting in cracking and separation of the concrete. For this reason, typical non-reinforced concrete must be well supported to prevent the development of tension

Granite Powder (GP) and Iron Powder (IP) are industrial by-products generated from the granite polishing and milling industry in powder form respectively. These by-products are left largely unused and are hazardous materials to human health because they are airborne and can be easily inhaled. An experimental investigation has been carried out to explore the possibility of using the granite powder and iron powder as a partial replacement of sand in concrete. Twenty cubes and ten beams of concrete with GP and twenty cubes and ten beams of concrete with IP were prepared and tested.

Keywords— Red Mud, Concrete, Building Material, Rcc,Replacement,

INTRODUCTION

The uses of industrial wastes which are pozzolanic in character and develop cementitious properties are used to replace cement and aggregates partially to improve strength, durability and help to protect the environment. The environmental impacts of extracting river sand and crushed stone aggregate become a source of increasing concern in most parts of the country.

Compressed stabilized soil or earth blocks are unfired blocks that are made of soil, stabilized with a binder, with or without the addition of fibres and compressed to form the block. The conventional fired bricks have been the mainstay of construction activities over the past several decades. However, in recent times, due to shortage of raw materials, rising material, and labour costs, the construction industry has started to look for other cost-effective alternatives. Traditional soil-based constructions like soil blocks, rammed earth, and stabilized earth have again started to gain popularity due to their cost-effectiveness being the primary reason. The energy spent in firing of traditional bricks is close to ten times higher than typical cement stabilized soil blocks. Traditional compressed soil blocks are cost-effective, fire-resistant, and easy to use, consume less energy for manufacture, and perform well in various climatic conditions with easy availability of raw materials. However, they do not perform well in the durability front and still do not have widespread acceptance. With the increasing popularity of the stabilized blocks, a lot of researchers have started concentrating on the beneficial use of solid wastes as raw materials in the manufacture of soil blocks. Solid wastes have become a sought-after resource for manufacture of construction materials due to their easy availability in sufficient quantities at cheap cost while also providing an avenue for their reuse and management. Soil engineering, especially soil stabilization, has become an avenue for management of solid wastes with lots of researchers involved in identifying the potential applications of various solid wastes. A lot of researchers have particularly started concentrating on the use of solid wastes in manufacture of bricks and blocks.

LITERATURE REVIEW

Bahar Demirel, 2010[1]:-In this investigation the effects of using WMD as finer material on the following properties of the concrete has been specified. Marble dust is a by-product of marble production and to create large scale environmental pollution. For this region four different series of concrete –Mix were prepared by replaced by fine sand with WMD at following proportions is 0, 25, 50 and also 100% by its weight. Compressive strengths of the samples were recorded at the curing stage of 3, 7, 28 and 90 days.

Baboo Rai, Khan Naushad H , Abhishek Kr, Tabin Rushad S, Duggal S.K, 2011[2]:-In this paper the result of using victimization marble powder and granules as constituents of fines in mortar or concrete by partially reducing quantities of cement further as different typical fines has been studied in terms of the relative workability & compressive further flexural strengths. Partial replacement of cement and usual fine aggregates by varied proportion of marble powder and marble grains reveals that increased waste marble powder (WMP) or waste marble granule (WMG) magnitude relation lead to inflated workability and compressive strengths of the mortar and concrete. Design mix for M30 grade of concrete was ready by part substitution fine combination with 5 totally different percentage by weight of marble granules 0%, 5%, 10%, 15%, and 20%. To hold out the planned study cubes of mortar (1:3) with varied partial replacement of cement with identical quantity of WMP were cast and tested at three different intervals of 7 days. Also cubes of (1:3) mortar with partial replacement of sand with the same amount of WM Granolas were cast and their strength was evaluated after 7, 14, and 28 days in different lots. Their results were compared with those of standard (1:3) mortar and Concrete cubes.

T. Shanmugapriya, R. N. Uma, June 2012[3]:- this paper gift the improvement of partial replacement of factory-made sand by natural sand with silica fume in High-performance Concrete (HPC).). the normal cement was partly replaced with silica fume by 1.5%, 2.5 %, and 5% and natural sand was replaced with factory-made sand by four proportions of 10%, 30%, 50%, 70%).It is observed that the compressive strength and flexure strength of concrete can be improved by partial replacement of Silica fume for cement and M-sand for fine aggregate. From the above experimental results it is proved that, M-Sand can be used as partial replacement for the natural sand, and the compressive and flexure strengths are increased as the percentage of M-Sand is increased up to optimum level. The optimum percentage of replacement of natural standby M-sand is 50%.

Chinana Suresh, Katia Bala Krishna, P.Sri Lakshmi Sai Teja, S.Kanakambara Rao 2013[4]:- To study this work is an effort to use Quarry mud as partial replacement for Sand in concrete. Additionally the study of properties of concrete and to research some properties of Quarry mud the quality of these properties to change them to be used as partial replacement materials for sand in concrete. The Replacement of the sand with quarry dust shows an improved in the compressive strength of the concrete. As the replacement of the sand with quarry dust increases the workability of the concrete is decreasing due to the absorption of the water by the quarry dust. The specific gravity is nearly same each for the natural stream sand and quarry dirt. The variation of the physical properties like particle size distribution and bulking is much varying parameter that which effect the mix design of the concrete. The check conducted at 50%replacement showed that the water-cement quantitative relation magnified 1.6 at thattheslump cone unsuccessful utterly. Within the before study Replacement of sand with the quarry dirt is 55% to 75% in case of compressive strength. Further increment the percentage of replacement can be made useful by adding the fly ash along with the quarry dust. Then 100% replacement of sand can be achieved.

Priyanka A. Jeddah, Delia K. Kulkarni, 2013[5]:-This paper puts forward the applications of factory- made sand as an endeavour towards property development. It'll facilitate to seek out viable answer to the declining handiness of natural sand to create eco-balance. The effect of partial replacement of natural sand by manufactured sand on the compressive Strength of cement mortar of proportion 1:2, 1:3 and 1:6 with water cement ration as0.5 and0.55 are studied. Results are compared with reference mix of 0% replacement of natural sand By manufactured sand. The compressive strength of cement mortar with 50%replacement of Natural sand by factory-made sand reveals higher strength as compared to reference mix. The general strength of mortar linearly will increases for 0%, 50% replacement of natural sand by factory-made sand.

T. Felixkala (et al. 2010) [6] had obtained the test results that granite powder of marginal quantity as partial sand replacement has beneficial effect on the mechanical properties such as compressive strength, split tensile strength, modulus of elasticity. They also indicated that the values of both plastic and drying shrinkage of concrete in the granite powder concrete specimens were nominal than those of ordinary concrete specimens. They examine the possibility of using granite powder as replacement of sand and partial replacement of cement with fly ash, silica fume, slag and super plasticiser in concrete. The percentage of granite powder added by weight was 0, 25, 50, 75 and 100 as a replacement of sand used in concrete and cement was replaced with 7.5% silica fume, 10% fly ash, 10% slag and 1% super plasticiser. The effects of water ponding temperatures at 26℃ and 38℃ with 0.4 water-to-binder (wb) ratios on mechanical properties, plastic and drying shrinkage strain of the concrete were studied and compared with natural fine aggregate concrete.

Kanmalai Williams. (et *al 2008* [7]) reported the results of an experimental study on the high performance concrete made with granite powder as fine aggregate. The percentage of granite powder added by weight a range viz. 0, 25, 50, 75 and 100% as a replacement of sand used in concrete and cement was replaced with 7.5%Silica fume, 10% fly ash, 10% slag and 1% super plastiziser. The effects of curing temperature at 32 Sand 0.40 water-to-binder (w/b) ratio for 1, 7, 14, 28, 56 and 90 days on compressive strength, split tensile strength, modulus of elasticity, drying shrinkage and water penetration of concrete were studied. Their results indicated that the increase in the proportions of granite powder resulted in a decrease in the compressive strength of concrete.

Nimitha Vijayaraghavan1 and a S Wayal1, November 2013[8]:-we have finished from experimental researchers that the All the mixes of concrete shaped by Replacement of natural sand by factory-made, experimental investigation of partial and full replacement of natural sand by factory-made sand. The most aim of the paper is to check the compressive strength and workability of concrete with factory-made and natural sand in variable proportions. The results show that Concrete with factory-made sand shows higher. Compressive strength whereas workability small with increasing proportion of factory-made sand.

G.Balamurugan, Dr.P.Perumal, 2013[9]:- This experimental study presents the variation within the strength of concrete once replacement sand by quarry dirt from 0%to 100% in steps of 10%. M20 and M25 grades of concrete are taken. The compressive strength of concrete cubes at age of 7 and 28 days is obtained Split tensile strength and flexural strength of concrete are found at the age of 28 days. From the check results Concrete acquires most increase in compressive strength at 50 % sand replacement. When compared with concrete with only river sand, the amount of increase in strength for M20 and M25 respectively. Split tensile strength is maximum at 50 % replacement of natural sand by quarry dust. The percentage of increase with control concrete for M20 and M25 respected Maximum flexural strength is also at 50 % replacement. The percentage of increase compared with control concrete for M20 and M25 respectively.

Tasnia Hoque, Muhammad Harunur Rashid, Md. Rokon Hasan, Ebna Forhad Mondol 2013[10]:- In this paper a fact-finding experiments reported on the mechanical properties of mortar changed by stone dirt as exchange material of each fine combination and cement. Mortar are investigated with the replacement of twenty fifth and five hundredth of fine combination and conjointly five-hitter of cement by stone dirt. The strength of mortar containing twenty fifth stone dirt is on top of traditional mortar containing solely sand**.** However the replacement of cement ends up in the decrease of strength of mortar.

H. S. Suresh Chandra, G. Sarangapani, and B. G. Naresh Kumar 2014[11]:- He was Investigated to work out the properties of hollow concrete blocks made by replacements and by quarry mud. Each partial 50% and complete replacement has been tried with and while not admixtures. Four different proportions have been considered. In two proportions studies have been made by considering different W/C ratios. In general the compressive strength varies from 4.07MPa to 7.33MPa for blocks prepared without using admixture. It was same for blocks prepared using admixture is 5.69 MPa to 8.10MPa In the production of Hollow concrete blocks sand can be replaced partially 50% replacement.by quarry dust instead of complete replacement. The blocks where 50% replacement is adopted performs better than blocks which are prepared conventionally using natural sand.

A Jayaraman1, April-June 2014[12]:-A study is conduct to work out the engineering properties viz. Compressive Strength, strength in tension and water absorption capability of the partly replacement of watercourse sand and normal cement .Partially replacing river sand with M-Sand and ordinary Portland cement with lime stone powder The Samples of concrete are made in three different grades, namely: M15, M20 andM25. It was found that 0.50 water/cement ratio used. The fine aggregate and standard cement portion of the combo is achieved by combining M- Sand and lime stone powdering quantitative relation with 50%-10 %, 50%-20% and 50%-30%.The specimens square measure tested for seven days, fourteen days and twenty eight days with every proportion of lime stone powder and M-Sand combine Compressive strength, tensile strength and flexural strength is found to increase with age as for normal concrete. The water absorption is Conventional concrete specimen resulted to decrease of the water absorption and permeability of the concrete.

N.Kiran Kumar, Dr.B.Damodhara Reddy , Smt.S.Aruna Jyothy , September 2014[13]:-In this study an effort is formed to seek out the suitableness of Granite Finesses a replacement choice to Natural Sand. The study evaluates the impact of solidifying age and blend proportions on the compressive strength of M 20 Grade concrete cubes subjected to partial replacement of sand with granite fines. A total of 75 cubes of 150mm X 150 mm X 150mm dimensions were cast and cured in water for 3, 7, 28, 60 and90 days with sand replacement by granite fines ranging from 0 to 40% respectively. From te check results its clearly evident that granite powder as a partial replacement of sand proves to be useful once mechanical properties of strength is taken into account. Concrete mix with 30 % addition of granite fines proves to be higher when put next with different proportions.

IJ. Karthick, IIT.Rama, IIIN.Mani Bharathi 2014[14]:-in this paper, we have investigated the study of quarry rock dust as partial replacement of fine aggregate in Concrete. Mix design has been developed for M20 grade using IS design for conventional concrete and replaced mix. Specimens on cubes, cylinders and beams were prepared for both conventional and 20%, 40%, 60% replacement with quarry dust. Tests were conducted on the specimens after 28 days curing to attain its maximum compressive, tensile and flexural strength. Graphs were drawn and results were compared with controlled mix. It is found that the effective replacement of sand with quarry dust is possible. The compressive strength of cubes with 28 days curing of controlled specimen Q0 is observed as 23.25 N/mm2. For 20% quarry dust replaced specimen i.e., Q20, the strength has been increased to 19.18% and for 40% quarry dust replaced specimen i.e., Q40, the strength has been increased to 35.26% but for 60% quarry dust replaced specimen i.e., Q60, the strength has been increased only up to 12.73%The split tensile strength of cylinders with 28 days curing of controlled specimen Q0 is observed as 1.66 N/mm2. For 20% quarry dust replaced specimen i.e., Q20, the strength has been increased to 60.24% and for 40% quarry dust replaced specimen i.e., Q40, the strength has been increased to 85.72% but for 60% quarry dust replaced specimen i.e.,Q60, the strength has been increased only up to 12.05%The flexural strength of beams with 28 days curing of controlled specimen Q0 is observed as 7.14 N/mm2. For 20% quarry dust replaced specimen i.e., Q20, the strength has been increased to 16.39% and for 40% quarry dust replaced specimen i.e., Q40, the strength has been increased to 21.98% but for 60% quarry dust replaced specimen i.e.,Q60, the strength has been increased only up to 13.73%

Sandeep Kumar Singh, Vikas Srivastava1, V.C. Agarwal, Rakesh Kumar and P.K.Mehta 2014[15]:-studied possibility of using stone dust as partial replacement of fine aggregate. Main point in study M25 concrete mix was used in the present investigation. It is found that the compressive and flexural strengths of concrete increase on use of stone dust. The replacement level of the fine aggregate 30, 40, 50, 60 and 70% by stone mud was investigated it's determined that the compressive strength isn't affected by replacement up to 40%; therefore the flexural strength in the least ages improved considerably in the least the replacement levels.

Pooja J.Chavhan, Prof. S. D. Bhole , April 2014[16]:-Have studies the marble powder is amendment with sand, the analysis is meted out by victimisation grade of M25concrete with replacement of 0%,5%,10%,15%,20%,25%,30%,35%,40%,45%,50%MP by sand and to see the optimum share of percentage of replacement that split tensile strength and maximum compressive strength is gain. The three specimens of each mix was prepared

and left for curing in the curing tank for 7, 14 and 28 days. He was observed that the Compressive strength increases with increase of marble powder and the maximum 28 days split tensile strength was obtained with 45%marble powder replaced with fine aggregate.

Candra Aditya, Abdul Halim, Chauliah Fatma Putri, 2014[17]:-This Experimental work will develop Performance of marble waste v Bulletin East Java region of Republic of Indonesia within the manufacture of concrete roof tiles by combining the employment of sand and WMP as alternative various for river watercourse sand and cement. This technique utilized in this study check to check} the essential material and test physical properties of concrete roof tiles. Concrete tile with marble waste produces lighter weight 3.6 % - 12.3 %. Replacement PC with marble powder by 20 % qualify flexural strength, water absorption. Replacement PC with marble powder and marbles and watercourse sand with water absorption inflicting the rise.

Rishi, Dr. Vanita Aggarwal, 2014[18]:-This study shows the experimental investigations on the replacement of cement and each part & combined with the waste marble powder/waste marble granules in which, by the partial replacement of cement and sand, the compressive, flexure and split-tensile strength get accrued up to an exact share however get reduced with the combined replacement of combination of cement & sand. It can be seen that combination of marble dust and other ingredients has modulus or compressive strength more than alone for 7 days and 28 days respectively. The utilization of high proportion of marble dirt will increase the strength of cement paste.

Anthony Woode David Kwame Amoah Bright Agora Freeman Kofi Logah Maxwell Yaw Dzakah, 2015[19]:-He was disbursed the experiment natural sand was replaced with factory-made sand of an equivalent grading because the natural sand, whereas keeping all different variables constant. Aside from the management concrete sample that had 100% natural sand all the opposite samples were treated to 10%, 20%, 30%, 40% and 50% replacement of the natural sand with factory-made sand. Concrete cubes of 150mmx150mmx150mm were with created with the varied proportions of cement, sand and stones during a combine quantitative relation of 1:2:4, water -cement quantitative relation of 0.45 and cured over 28 days. The results of compressive strength tests show that the strength of the concrete cubes with varied amounts of natural sand and made sand modified marginally. This was understood to mean that the partial replacement of natural sand with factory made sand up to 50% in concrete results in about 6% increase in the strength of the concrete.

A. Suribabu, Dr U.Rangaraju, Dr.M. Ravindra Krishna, and January 2015 [20]:-It is found that the compressive and flexural strength of concrete fabricated from Quarry Rock Dust are nearly 10% over the traditional concrete. Tests were additionally conducted on cubes and beams that are exposed to temperatures of 300°Cfor 1hr, 3hr durations severally. Mix design have been developed for M25 and M40grades victimization style approach IS for each standard concrete and quarry dust concrete. Tests were conducted on cubes and beams **to** review the strength of concrete fabricated from Quarry Rock dirt and also the results were compared with the Natural Sand Concrete For the designed mix proportions of M25 and M40 grades of concrete the desired characteristic strengths for cubes are achieved in both conventional concrete and Quarry Stone dust concrete.

Bhupendra Singh Kalahari, Dr. Rajeev Chandak, R.K.Yadav, 2015[21]:-The mainobjective of this study is to explore the chance of victimization marble powder waste as partial replacement of fine aggregate in concrete. Since this concrete is ready with marble powder as a partial replacement of fine aggregate (Sand) in four different proportions i.e. 10%, 20%, 30% and 40% and tested for the period of 7days, 28days, 90days curing. This compressive strength compared with the conventional concrete i.e. Concrete prepared without marble powder. The results are show that the compressive strength of concrete is increased when the percentage of marble powder waste is increased up to 20% and by further increasing the percentage of marble powder waste compressive strength gets reduced. Test also indicates that the waste marble powder can be successfully utilized as partial replacement of fine aggregate in concrete production. Their use in concrete will alleviate the problem of their disposal and environmental pollution.

Vijaya Kumar Y.M., Bhargavi Ganesh, Arun Bhargava K.C., Kavyashree N.,Dhanush B., and June 2016 [22]:-The project involves the method within which fine aggregate in concrete is replaced by CRP at 0%, 20%, 40% and 60% replacement. Grade of concrete M25 is selected for the project. The project includes determination of compressive strength and split tensile strength at the ages of 7 days and 28 days the strength properties of concrete with CRP replacement ar compared therewith of traditional Concrete (NC) that doesn't contain CRP. On finding out the hardened properties of concrete for replacement of fine combination by Quarry dust/Crushed rock powder, we tend to come back to a conclusion that fine combination **is** replaced by quarry dust up to a optimum percentage of 20 for both compression and tension, later any increase in percentage of quarry dust will result in loss of both compressive and tensile strength of concrete.

Akshay A.Waghmare, Akshay G.Kadao, Ayushi R. Sharma, and Sunil G. Thorve2016 [23]:-Aim of project is to check the strength and durability performance of concrete created with natural sand and artificial sand. Therefore a shot have been created to debate the properties like workability tensile strength and compressive strength of ready by commutation natural sand with artificial sand at different replacement level 0%, 20%, 40%, 60%, 80%, 100%.This experiment shows that the concreting can be done economically eco-friendly. The compressive strength increases up to 60% variation and then it decreases up to 100%, but still at 100% strength is more than 0% replacement of natural sand.

Dr B Krashna Rao, 2016[24]:- River sand is expensive because of transportation, giant scale depletion of resources and social control rules. Quarry mud are often used as an alternate to the stream sand. Analysis shows that there's four-hundredth savings if quarry mud is employed rather than sand. Has done a study on 100 percent replacement of standby quarry mud in concrete. The compressive strength of concrete with quarry mud has four-hundredth a lot of strength than that of the concrete with sand

Dr. Suji D, Krishna Kumar S, Perarasan M, Niranjani E, 2016[25]:-Have conducted experiment to study the Waste marble powder and quarry dust as replacement of cement and fine aggregate in concrete and as compared to the Normal concrete. Mix design has developed for M20 concrete. The quarry dust in place of sand is replaced with 25% and waste marble powder in place of cement is replaced partially with various percentages 2.5%, 5%, 7.5%, 10%, 12.5%, and 15%.he was investigate the utility of using quarry dust and waste marble powder in concrete. He was observed that the quarry rock dust

and waste marble powder increases at 12.5%. Therefore the quarry dirt and waste marble powder ought to be utilized in construction works, then the value of construction ought to we tend to less and therefore the natural resources would be used expeditiously.

G. SIVAPRAKASH, V. SARAVANA KUMAR and LAKHI JYOTI SAIKIA, 2016[26]:-This paper deals with the experimental study on the strength properties of M25 grade concrete with the partial replacement of sand by exploitation ceramic waste. so as to investigate the mechanical properties like compressive, split tensile, flexural strength, the samples were casted with 10%, 20%, 30%, 40%, 50% replacement of sand exploitation ceramic waste and tested for different periods of curing like 7 days, 14 days and 28 days. Results are show that the replacement of river sand using 30% ceramic waste in concrete gives the required strength and can be considered as optimum percentage.

Deepankar Kumar Ashish, S K Verma, Ravi Kumar and Nitisha Sharma,2016[27]:-In this experimental study, the mix design is taken as M30. In this research work, the effects of using waste marble powder (WMP) as a partial replacement of cement and sand on the properties of the concrete have been investigated. He was partially replacing cement, sand with WMP at proportions of 0-15% by weight separately. it was observed that the addition of WMP such that would partially replace the sand and cement separately at particular proportions. Based on the experiment result it showed that replacement of sand by marble powder up to 15% increases the compressive strength but replacement of cement up to 15% content of marble powder decreases the compressive strength.

N. Gurumoorthy,(2015)et.al. "Performance of concrete contained marble dust as a partial of cement" [28] they take this 10%, 20%, 25% and 30% replacement percentage variations. The compressive strength was increased with addition of waste marble dust up to 25% replace by weight of cement. Further any addition of waste marble dust the compressive strength decreases. Therefore it was concluded that the most suitable percentage replacement of marble dust in concrete is 25%.

Rakesh Gupta (2014)et.al. "Partial replacement of cement with waste marble powder" [29] in this work they concluded that for M20 grade concrete the compressive strength of cubes are increased with addition of waste marble powder up to 10% replace by weight of cement and further any addition of waste marble powder the compressive strength decreases. The split tensile strength of cylinders are increased with addition of waste marble powder up to 10% replace by weight of cement and further any addition of waste marble powder the split tensile strength decreases.

Pooja J. Chavhan (2014) et.al "To study the behavior of marble powder as supplementary cementations material in concrete" [30] they studied and concluded that compressive strength increases with increase of marble powder. The maximum 28 days spilt tensile strength was obtained with 45% marble powder replaced with fine aggregate where as in case of compressive strength the strength was gained by replacement of 30% along with replacement of sand by 45-50%. The marble slurry utilization in black cotton soil is one of the best ways to improve soil properties and to protect the environment up to some extent from the harmful effects of disposal of marble slurry in land and water.

Manju Pawar (2014)et.al."Partial replacement of Cement with Waste Marble Powder" [31] A Study has been conducted on Periodic Research, The Significance of Partial replacement of Cement with Waste Marble Powder. They found that the effect of using marble powder as constituents of fines in mortar or concrete by partially reducing quantities of cement has been studied in terms of the relative compressive, tensile as well as flexural strengths. Partial replacement of cement by varying percentage of marble powder reveals that increased waste marble powder (WMP) ratio result in increased strengths of the mortar and concrete. Leaving the waste materials to the environment directly can cause environmental problem. Hence the result, The Compressive strength of Concrete are increased with addition of waste marble Powder up to 12.5% replace by weight of concrete

M. Ranjitham, B.Piranesh(2014)et.al. "Experimental Investigation on High Performance Concrete with Partial Replacement of fine aggregate by Foundry Sand with cement by Mineral Admixtures" [32] In this project, investigations were carried out on strength properties such as compressive strength, split tensile strength and flexural strength of M75 grade of HPC mixes with different replacement levels such as 10%, 20%, and 30% of foundry sand with fine aggregate and 10%, 20%, 30% and replacing cement by mineral admixtures such as fly ash and ground granulated blast furnace slag by adopting water-binder ratio of 0.3. Super plasticiser for better workability for high performance concrete. The result of these investigations demonstrates the strength characteristics of foundry sand based concrete mixes. Based on the results obtained, the replacement of 30% foundry sand with 3% of super plasticiser which superior strength characteristics was arrived.

Sohail Md (2013) et.al. "A study on the mechanical properties of concrete by replacing sand with foundry sand" [33] investigated the foundry sand can be used as a partial replacement of cement or fine aggregates or total replacement of fine aggregate as a supplementary addition to achieve different properties of concrete. In the present study, effect of foundry sand over fine aggregate replacement on the compressive strength, split tensile strength and flexural strength having mix proportions of M-30 has determined. Fine aggregates replaced with eleven percentages of foundry sand. The percentages of replacements were 0, 10, 20, 30, 40, 60,70,80,90 & 100 % by weight of fine aggregate. Tests has performed for compressive strength, split tensile strength and flexural strength tests for all replacement levels of foundry sand at different curing period (7 days, 28 days & 56 days).

Pathariya Saraswati(2013)et.al. "Application of waste foundry sand for evolution of low cost concrete" [34] studied the use of waste foundry sand as a partial replacement by fine aggregate in concrete. An experimental study is carried out on a concrete containing waste foundry sand in the range of 20%, 40%, and 60% by weight for M-25 grade concrete (PPC). Compressive strength increases on increase in percentage of waste foundry sand as compare to traditional concrete. In this study, maximum compressive strength is obtained at 60% replacement of fine aggregate by waste foundry sand. Split tensile strength decrease on increase in percentage of waste foundry sand.

Khatib and Baig (2010) et.al. "Foundry sand utilization in concrete production" [35] investigated fresh and hardened properties of concrete containing waste foundry sand (WFS) replaced with 0 to 100% with fine aggregate. The water to cement for all mixes was kept constant. Testing on hardened properties was mainly conducted at 14, 28 and 56 days. The results show that the incorporation of waste foundry sand in concrete causes a systematic decrease in workability, ultrasonic pulse velocity and strength and an increase in water absorption and shrinkage of concrete. They also

reported that an acceptable concrete strength can be achieved using foundry sand. Produced by replacing natural sand with UFS in various percentages (10%, 20%, 30% and 40%). Based on the test results they concluded that (i) workability goes on reducing with increase in UFS content; (ii) At 28-days, Compressive strength, splitting tensile strength and flexural tensile strength for different replacement levels of UFS is increased whereas flexural tensile strength goes on reducing for UFS content more than 20%; (iii) At 28-days, the modulus of elasticity values increases with replacement of UFS up to 20%. They also concluded that the UFS can be utilized as a replacement to regular sand in concrete up to about 20%.

T. A. Naik (2010) et.al. "Utlilization of used foundry sand in concrete" [36] investigated the fresh and hardened properties of concrete containing waste foundry sand as a replacement of fine aggregate. Regular concrete sand in the concrete mixes were replaced with 25% and 35% of waste foundry sand and clean foundry sand by weight. The results indicated that the concrete mixture containing 25% of WFS showed an increase in their values by 10% when compared to the concrete mixture containing 35% of WFS. Compressive strength of the control mix was about 20-30% higher than the mixes containing waste foundry sands. The test results also indicate that there was not much difference in the values of density for both hardened and fresh concrete.

Observation From The Research Papers

The main objectives of this research are:

1. To make and optimal the mixture compositions of grade of concrete M30 mix Concretes on the basis of their tensile and workability and also compressive test;
2. Comparative experimental study of concreter M30 mix concrete in compressive, flexural test and also test of workability of concrete on replacement different percentage of cement and aggregate by red mud, waste brick bats.
3. To construct model the tensile actions of M30 grade of concrete with different combinations of waste material, on the basis of performed its properties test.
4. To perform a study on its utilization in the engineering practice and to assess this utilization from engineering, technical and economical point of view.
5. To perform a study on red mud or red oxide, brick bats. It's that very chipper material, easily available and also the waste material respectively.

This workfare consists the complete perception of the growth M30 grade of Concrete, from its raw materials and its utilization in the engineering practice.

CONCLUSION

After reading all of the research we can conclude that Concrete and cement are not the same thing; cement is actually just a component of concrete. Concrete is made up of three basic components: water, aggregate (rock, sand, or gravel) and Portland cement. Cement, usually in powder form, acts as a binding agent when mixed with water and aggregates. This combination, or concrete mix, will be poured and harden into the durable material with which we are all familiar. According to theory of concrete the mixing of different ingredient as same function of cement, cement and aggregate with respected to sugar cane baggers ash powder as well as brick bat sand basalt stone whose replace with sand or cement. Where we try to achieve to same strength of concrete.

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