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Generalized star beta closed sets in bi-topological spaces

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We introduce t_it_j-$g^*\beta$ closed sets in bitopological spaces. We have studied the relationship between this type of closed sets and other existing closed sets in bitopological spaces. Also we present t_it_j-$g^*\beta$-continuous function and t_it_j-$g^*\beta$-irresolute function in bitopological spaces and some of their basic properties are reviewed.

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Evaluation of The Shear Strength Design Equations for Slender and Non-Slender RC Beams Admixtured With Recycled Concrete Aggregate Without Web Reinforcement

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In this investigation, studies were done to know the effect of the presence of recycled coarse aggregates (RCA) and Pozzolans in shear deficient rectangular beams in evaluating the shear strength of concrete. The selected slender and moderate deep beams without shear reinforcement were tested under two-point loading and the obtained results are compared with the renowned research work and design codes on natural coarse aggregates. An important observation is the replacement ratio of RCA is an important parameter to be introduced in the equations proposed by the various researchers on shear strength prediction while the current design codes are conservative in the prediction of ultimate shear strength of beams. The proposed method is then verified using the available experimental data of 330RCA and NCA data of rectangular beams without stirrups.

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AN EXPERIMENTAL STUDY ON DURABILTY OF PERVIOUS CONCRETE

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Abstract: Pervious concrete is a special high porosity concrete used for flatwork applications that allows water from precipitation and other source to pass through there by Reducing the Runoff from a site and Recharging Ground Water Levels. Durability and Water Absorption are important properties of Pervious Concrete. This paper represents the experimental methodology and experimental results related to durability and water absorption. Cylinders of size 100 mm Ø and 200 mm height are prepared to investigate both these properties. This investigation should be carried out at the end of 28 days for water absorption and 56 days for durability in which cylinders are immersed in Sodium Chloride (NaCl) Solution after 28 days of casting. Different concrete mix proportion such as 1:5, 1:7 and 1:9 with different size of gravel such as 18.75 mm and 9.375 mm should be used to check both these properties of pervious concrete. Test results indicates that pervious concrete made by 1:6 concrete mix proportion has more durability and less water absorption and pervious concrete made by 1:10 mix proportion has more water absorption and less durability that`s why durability and water absorption are inversely proportional to each other.

Keywords: Pervious concrete, porosity, durability, Porosity

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IDENTIFICATION OF CRITICAL CONSTRUCTION DELAY FACTORS: AN INDIAN PERCEPTION

M.V. Krishna Rao, Abdul Rafae Syed, L. Amogh Reddy D, and Sudarshanam Abhilash

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Abstract: Construction delays are a general phenomenon that persists in most of the construction projects and thus requires an extensive analysis in order to identify the potential delay factors. To identify the critical delay factors, a questionnaire was developed to conduct an industry survey aimed to obtain a collective opinion of professionals in the Indian construction industry. The questionnaire was distributed to 175 construction professionals at Hyderabad, India who have at least 10 years of experience in the construction industry and the rate of return was 78.2%. Most of the survey was performed physically via paper and by online means with 39 site engineers, 35 contractors, 23 consultants, 21 private clients, and 19 public clients. The objective of this paper is to identify the most critical delay factors that contribute to delays in the construction projects and rank them using the Relative Importance Index (RII). The individual group of factors is subjected to the Cronbach's alpha (Cα) test to assess their reliability or internal consistency. Spearmen's rank correlation coefficient, r. was also used to observe the existence of correlation between the interpreted choices made by the different paired groups of respondents (contractors, consultants, clients) so as to report any significant differences in their opinion. The results of the analysis show varying opinions among the respondents based on their work experience, designation, and the scale of construction projects they have worked upon. This paper accentuates the importance of identifying the critical delay factors that aid in delay analysis and in creating awareness to minimize their effects during the course of the construction project.

Keywords: Construction delays; critical delay factors; Industry survey; Cronbach's alpha (Cα); Relative Importance Index (RII); Spearmen's rank correlation coefficient.

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Chapter 8

PERFORMANCE OF DIFFERENT GRADES OF SELF COMPACTING CONCRETE (SCC) WITH RECYCLED CONCRETE AGGREGATES (RCA)

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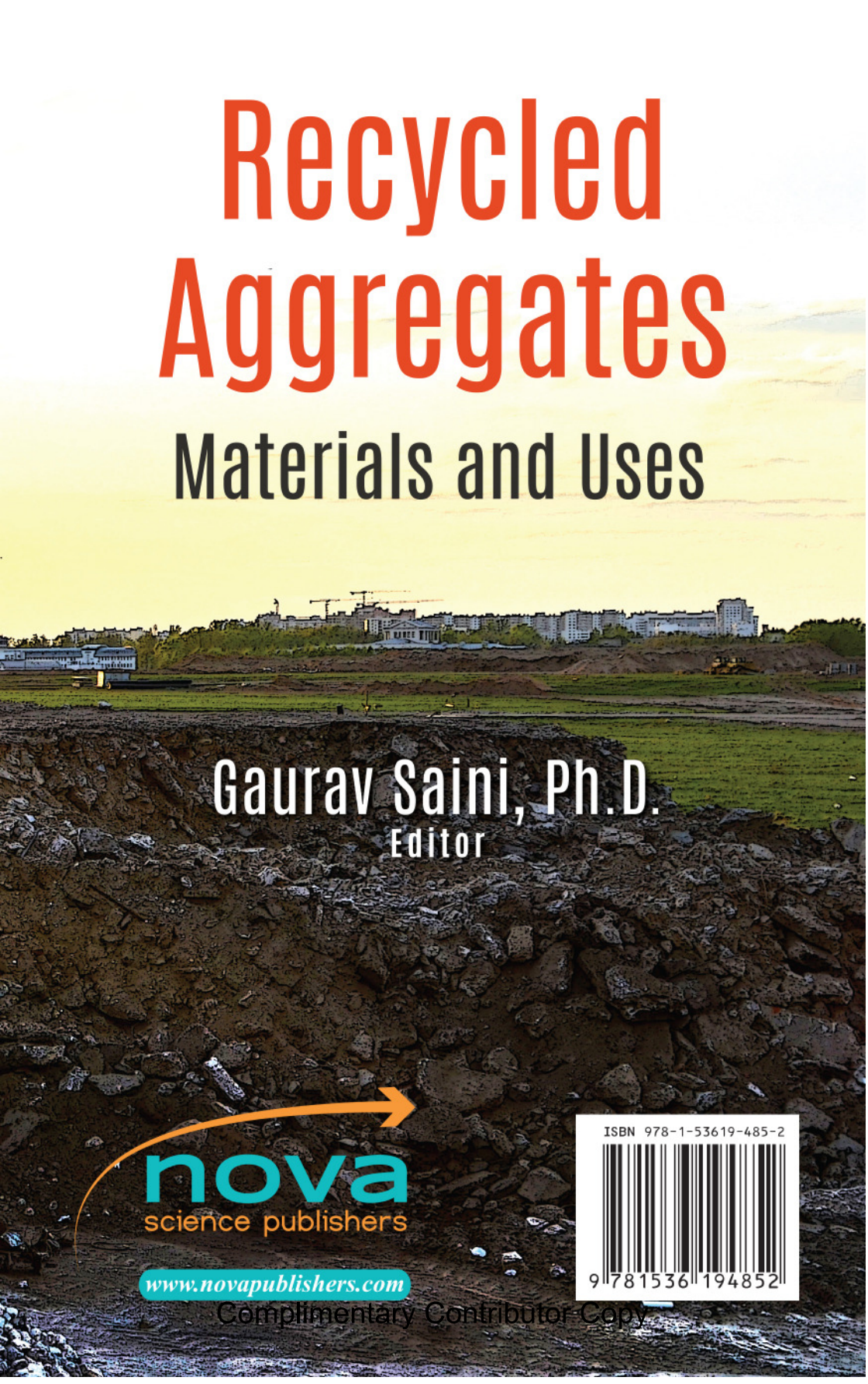
ABSTRACT

This chapter describes the investigations on the consumption of recycled concrete aggregates (RCA) in the production of self compacting concrete (SCC). It has been described as the most revolutionary development in concrete construction in the recent past. It has many advantages like rapid construction, a decrease in manpower, improved surface finishes, easier placing, enhanced durability, reduced noise levels due to the absence of vibration, and a safe working environment. Further, the dismantling of old structures to construct high-rise buildings is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An Experimental Investigation of Self Compacting Concrete containing Recycled Concrete Aggregates

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ABSTRACT:

There is an increasing demand for production of Self-Compacting Concrete (SCC) now in the present construction industry, which has its roots in the early 1980's. As everyone in the construction industry are searching for an alternative to traditional concrete, this SCC has been providing best solution and rectifying all the problems that were faced by using traditional concretes. The application of recycled aggregate in Self Compacting Concrete (SCC) is influenced by the quality of the concrete from which the recycled aggregates are generated. In recycled aggregates, mortar gets attached to it. The physical and mechanical properties of the recycled aggregates relate to the quality and quantity of the Recycled Aggregate Concrete (RAC) produced.

This paper highlights the properties of recycled concrete aggregates produced in Hyderabad (India) in comparison to the properties of Natural Aggregate prescribed in Indian Standards. It briefly discusses about some of the guidelines/specifications of recycled concrete aggregate adapted for structural applications in various countries, and also describes the outcome of tests carried out on the use of Recycled Concrete Aggregate in Self Compacting Concrete. Recycled aggregates used in this study were produced by crushing of Construction and Demolition Waste (CDW) collected from buildings being dismantled for renovation. Seven different concrete mixes were produced; five recycled concrete aggregate percentages viz. 0%, 25% 50%, 75% and 100% with varying fly ash content. Investigation on Utilization of RCA in M30, M50 and M70 grade Self Compacting Concrete based on the experimental studies carried out at Research center JNTUH–Hyderabad. on Self compacting concrete(SCC) made of recycled concrete aggregate(RCA), conclusions are drawn on their utilization for making concrete with the help of modified Nan Su mix design, regular mixing technique and with the addition of mineral admixtures. Tests were carried out for compressive strength, split tensile strength and flexural strength. The findings from the study show that the recycled concrete aggregate may be useful for construction industry as an alternative for natural aggregates. However, further research is needed particularly on the long term field performance of the recycled aggregate concrete before it can be used with confidence.

Keywords: *Self Compacting Concrete (SCC), Recycled concrete aggregate (RCA), Indian Standards(IS), Mix design*

Performance Characteristics of Self-cured Recycled Aggregate Concrete with SCM's

Lakshmi Thotakura, Sankar Kumar Reddy Pullalacheruvu, Ganesh Babu Kodeboyina, and V. Krishna Rao Mupparisetty

Abstract Self-cured recycled aggregate concrete with shrinkage reducing admixtures is one of the pioneering researches in the construction industry. There is a possibility of depletion of natural resources due to prolonged consumption over a period of time in our modern civilization. In this research, characteristics of recycled aggregate concrete with supplementary cementitious materials (SCM) like powdered limestone and fly ash with self-curing agent PEG6000 were investigated along with the conventional concrete. Hydration plays a predominant role in the properties of hardened concrete. Particularly in high strength concretes, micro cracking occurs due to the absence of pore water and lack of relative humidity thus causes self-desiccation. The experimental studies exhibit the performance of concrete mixes with 35% limestone powder in LP60 and 35% fly ash in SC60 and RA60. The mechanical and durability properties of M60 concretes with SCM's and PEG6000 were investigated. The results indicated that concretes with 1% self-curing compound shows improved results than the mixes with 0%. All the concretes mixes achieve the properties at the range of self-compacting concrete in the green state.

Keywords Concrete · Curing-internal curing · Self-curing · Supplementary cementitious materials-limestone powder · Fly ash · Recycled aggregate · PEG6000

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Mathematical Model for Prediction of Compressive Strength of Normal, Standard and High Strength SCC with RCA

Srinivas Vasam, K. Jaganadha Rao, and M. V. Seshagiri Rao

1 Introduction

Concrete is the most widely used man-made material and its consumption is now next to water. Concrete has become popular because of its mouldability into any complex shape, abundant availability of its ingredients, relative economy and high compressive strength. Concrete is no mere a mixture of cement, coarse aggregates, fine aggregates and water. The development of new admixtures has completely changed the definition of concrete. Though there is a considerable research in the last few decades on concrete-making materials and technologies, concrete has certain drawbacks like the presence of voids due to improper mixing/compaction which affects strength and durability. Self-compacting concrete (SCC) is one of the solutions to minimize such voids in concrete. Self-compacting concrete finds several applications in the construction field due to its multiple advantages like ease of placement, reduced noise pollution, less concreting time, etc. A lot of research is being carried out in the last few decades on SCC with the use of different combinations of mineral and chemical admixtures.

The focus on recycled aggregate concrete is gaining importance to address the problems of depletion of natural resources and disposal of construction and demolition waste to some extent. The use of recycled concrete aggregate (RCA) in SCC

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An Analytical Approach on Effective Selection of Sustainable Materials in Construction Industry by Environmental Management System (EMS) & Green Supply Chain Management

Srinivas Vasam[1*], Dr.K. Jagannadha Rao[2], Dr. M.V.Seshagiri Rao[3], Vasu Kathi[4]
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Abstract

For the construction industry the 'sustainability' has become a common word and is also a mandatory concept that is being persisted by the client in the contract itself such has become its importance. The construction industry which has been the predominant contributor for the environmental pollution has been trying to march towards reduction of CO_2 foot prints by making use of sustainable materials.

In this paper, a critical literature review has been conducted about the sustainability and its concepts in a detailed manner. Further review has also been conducted on the possible new sustainable materials which might yield better results in reduction of CO_2 emission and shall sustain though the life span of the project in an effective and efficient manner. Under pinning the fact that selection of these sustainable materials for different construction projects has become a major concern in present construction industry. This paper shall discuss on possible effective methods for identification of suitable sustainable materials for the projects by environmental management system and green supply chain management. From this paper it can be understood that construction industry is slowly marching towards usage of eco-friendly materials and more importantly trying to implement an effective environmental materials selection system such as adoption of green supply chain management thereby which striving towards reduction of CO_2 emission in projects.

Keywords: Environmental management system, Green supply chain, Supply chain management

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MF-104: USE OF RECYCLED CONCRETE AGGREGATE IN SELF COMPACTING CONCRETE: A NEED FOR SUSTAINABLE DEVELOPMENT

SrinivasVasam[a], K. JagannadhaRao[b], M.V.SeshagiriRao[c]

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ABSTRACT

Construction has a major share in developing infrastructure in any Country. Accordingly, in the next five years, infrastructure in India will need a huge expenditure. 'Recycled' concrete aggregate could be a reliable alternative to using natural aggregates in concrete construction which unfortunately is not put to re-use. Dumping of wastes on land is not only causing shortage of space, but also environmental problems in cities. Further, due to urbanization, distance between demolition waste generation area and disposal land area has also become longer and therefore, transportation cost for disposal has increased and thus resulted in the excessive use of energy. Recycling of demolished waste can offer not only the solution of growing waste disposal problem, but will also help to conserve natural resources for meeting increasing demand of aggregates for long time to come for construction industry leading to sustainable development.

This paper describes the outcome of tests carried out about the use of Recycled Concrete Aggregate in Self Compacting Concrete(RASCC). Recycled aggregates used in this study were generated by crushing of construction and demolition waste (CDW). Seven different grades of concrete mixes (M20 to M70) were produced with five recycled aggregate contents (0%, 25% 50%, 75% and 100%). Compressive strength, split tensile strength and flexural strength of the concrete were determined. It was observed that there was no significant variation in compressive strength, split tensile strength and flexural strength of concrete. The findings from the study show that the recycled concrete aggregate may be useful for construction industry as an alternative construction material to natural aggregates.

Keywords: *Recycled concrete aggregate, Construction and Demolition Waste (CDW), Recycled Aggregate Self Compacting Concrete(RASCC). Sustainable Environment.*

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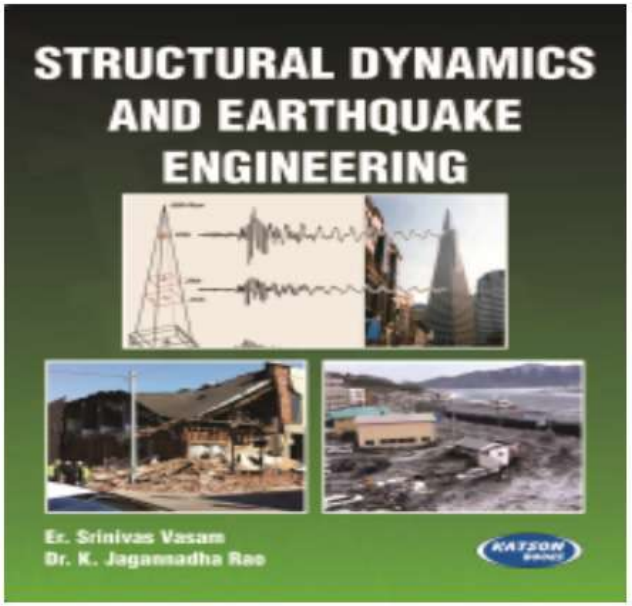

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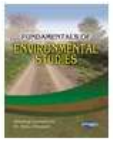

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FLEXURAL AND SHEAR BEHAVIOR OF HIGH STRENGTH POND ASH CONCRETE

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Abstract: Concrete is most widely used construction material. Traditionally concrete is made up of cement, river sand as fine aggregate, crushed stone aggregate as coarse aggregate and potable water. Nowadays, river sand is not readily available for use in many places. Instead of natural river sand, crusher sand or manufactured sand obtained from stone aggregate quarries is widely used as fine aggregate in concrete. The main objective of this study was to identify alternative source of good quality fine aggregates which is depleting very fast due to the fast pace of construction activities in India. In the present study the experimental investigations carried out to evaluate the effects of replacing the pond ash with river sand use of super plasticizer, on various concrete properties. Use of pond ash is a waste industrial by-product of power plants provides great opportunity to utilize it as an alternative to normally available aggregates It is found that as the percentage of Pond ash increases from 10% to 15% the strength of the pond ash concrete increases but the results are lower than the target mean strength of the respective M50 and M60 grades of concrete. Hence in the present work 20% replacement of sand by pond ash is considered and the target mean strength values are obtained. The target mean strength of (M50, 66 N/mm^2 and M60, 69 N/mm^2) pond ash replacement was considered to cast the cubes, cylinders and prisms reinforced concrete beams. The Flexural Behaviour of RC beams shows that the ultimate load carrying capacity and shear capacity of concrete. The 28days characteristic compressive strength of M50 and M60 grade Pond ash concrete is 6% and 7.7% higher than the target mean strength of M50 and M60 conventional concrete respectively. The flexural behavior of RC beams with pond ash shows that the failure is brittle when compared to the conventional concrete. The energy absorbed by the conventional beams is more than the pond ash beams. Therefore pond ash is suggestible for construction practices by improving the properties by conducting future studies.

Keywords: High strength concrete, Pond Ash, Fine aggregate, Waste material, Environmental issues, Mechanical properties, Flexural behavior.

1. INTRODUCTION

1.1 GENERAL

Concrete is a commonly used building material in the world. Conventional concrete is a mixture of cement, fine aggregate, coarse aggregate and water. Compare to all other ingredients, aggregates occupy 75 to 80 % of the total volume of concrete and affect the fresh and hardened properties of concrete. In the total composition of concrete, 25 to 30 % was engaged by the fine aggregate in volume. The quality of concrete is persistent by its mechanical properties. The mechanical properties mainly divided into short-term and long-term properties. Compressive strength, Split tensile strength, Modulus of Elasticity and Flexural strength are short term properties. Porosity and impermeability are the long term properties.

1.2 HIGH STRENGTH CONCRETE

American concrete Institute defines a high-strength concrete and high performance concrete as concrete that has a specified compressive strength to design of 6,000 psi (41 MPa) or greater. Under the ACI definition durability is optional and this has led to

Behaviour of Recycled Aggregate based Steel Fiber Reinforced Self-Compacting Concrete under Shear

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Present study is intended to investigate the effect ofrecycled aggregates as complete replacement of natural aggregate on mechanical and shear performance of self compacting concrete. In the experimental study, two grades of self-compacting concrete (SCC30 and SCC70) were considered. A total of 16 shear deficient beams of which 8 are natural aggregate remaining 8 are recycled aggregates beams were designed, cast and tested for a shear span to depth ratios (a/d) 2 for both without and with steel fibers. Due to the use of recycled concrete aggregates as complete replacement of coarse and fine aggregates, compressive strength is reduced by 8% for SCC30 (30MPa) & SCC70 (70MPa) Concrete. Ultimate shear strength is reduced by 14% and 12% for SCC30 and SCC70 beams respectively.

Keywords: Self-compacting concrete, recycled aggregates, steel fibers, shear strength.

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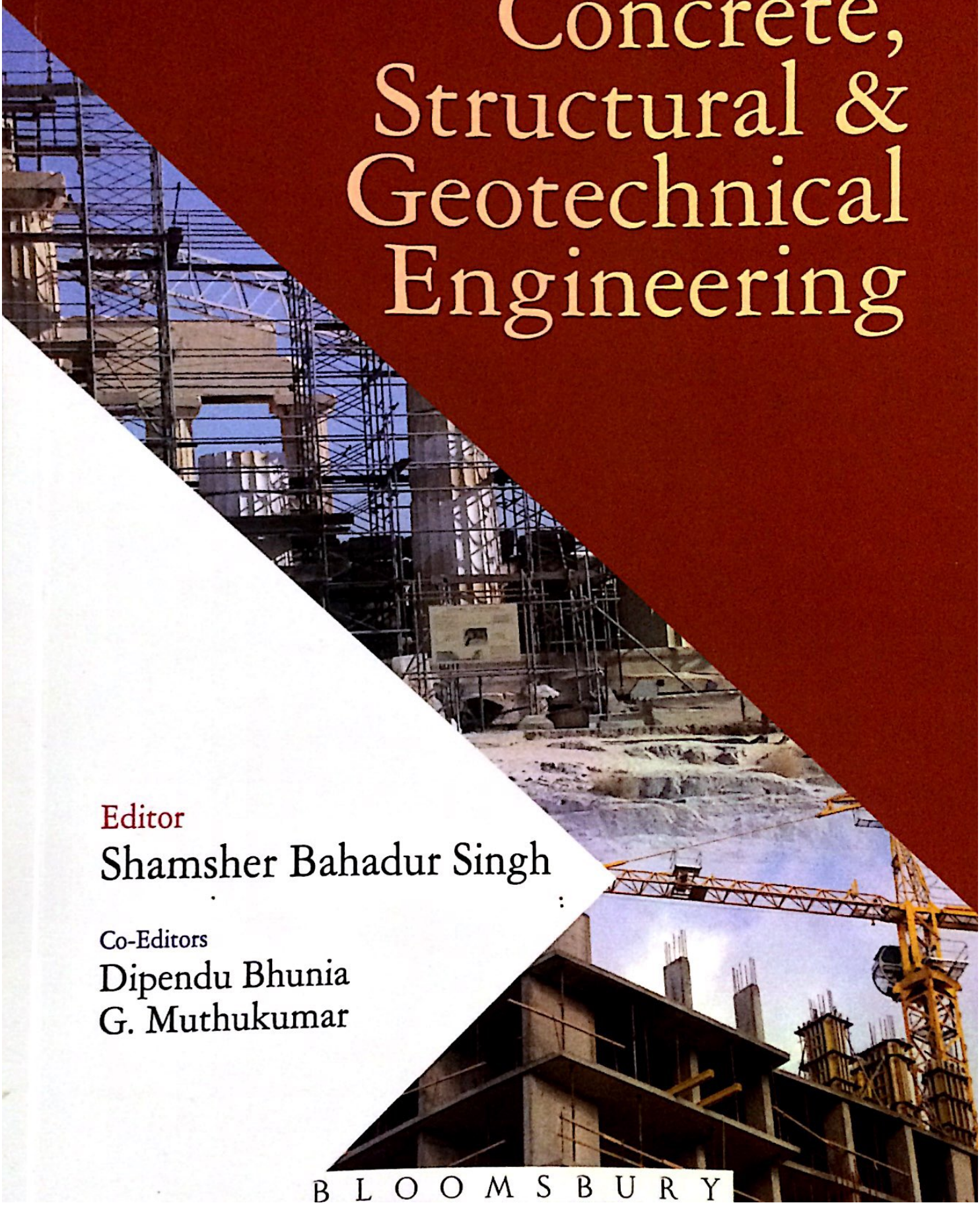

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BASIC STUDIES ON SCC USING RECYCLED AGGREGATE

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ABSTRACT: *Self Compacting Concrete (SCC) is a special type of concrete which flows and consolidates by its self weight, thereby eliminates the problems of placing in difficult situations such as congested reinforcement and thinner sections. Due to growing environmental concerns of the construction industry, it is now believed that the materials such as Recycled Aggregate (RA) are indispensable for enhanced environmental and durability performance. The ongoing demand of construction industry has to meet the functional, strength, economical and durability requirements. In the present study the experiments were carried out on M35 and M45 grade of concrete under self compacting conditions. The self compacting properties for the present grades of concrete were evaluated using EFNARC 2005 specifications. The natural coarse aggregate was replaced at 0%, 25%, 50%, 75% and 100% by recycled coarse aggregate (RCA) in unprocessed and processed (500 and 1000 revolutions in Deval's Abrasion) state. Fresh properties such as Slump, V-funnel and L-box for SCC were determined for various percentage replacement levels of recycled coarse aggregate. The hardened properties such as compressive strength, split tensile strength were determined. The non-destructive test such as rebound hammer was used to evaluate compressive strength. The unprocessed and processed (500 and 1000 revolutions) test results were compared to get the optimum replacement level of recycled coarse aggregate (RCA).*

Keywords: *Self Compacting Concrete (SCC), Recycled Coarse Aggregate (RCA), Superplasticizers (SP).*

INTRODUCTION

New materials and new construction techniques are coming up in order to reduce the manpower in construction industry. Self compacting concrete (SCC) is a special concrete tailored to overcome the problems of compacting in case of dense reinforcement and thin sections. As far as Indian scenario is concerned lack ofspecifications in terms of SCC production is also creating confusion among the researchers and structural engineers who are working in this specified area.

Akbari et al [1] investigated on Self Compacting Concrete Using Recycled Coarse Aggregate and concluded that the mixes containing recycled coarse aggregate gains quick early strength due to presence of partially hydrated cement adhered to coarse aggregate which accelerates the hydration process in case of unprocessed state. Most of the research was carried out on the use of recycled coarse aggregate in unprocessed state. Shahil M.Bandi et al [2] in their technical paper discussed that RCA show higher water absorption compared with conventional NCA due to old mortar attached with original concrete and has relatively lower specific gravity. Nataraja et al [3] in their discussion on-performance of recycled aggregates in self compacting concrete mentioned that as the percentage of RCA increases, the dosage of SP also increases to maintain a constant slump. Jitender Sharma et al [4] in his technical paper suggested that new standards should be introduced for recycled aggregates so that these materials can be used successfully in future. The fresh properties of SCC such as surface texture, flowability can be improved by processing of aggregate.

Study on Mechanical Properties of Recycled Coarse Aggregate Concrete with Stone Dust

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***Abstract* - In the recent times, usage of recycled coarse aggregate (RCA) as replacement of natural aggregate in concrete is gaining popularity all over the world. In the process of preservation of the environment and sustainable development, recycled coarse aggregate (RCA) is playing a major role in the construction industry. RCA is obtained by crushing the construction rubble obtained from demolished structures. Many countries are giving many infrastructural laws relaxation for increasing the use of recycled aggregates. River sand is most commonly used fine aggregate in the production of concrete. Using river sand in large quantities poses the problem of acute shortage in many areas. In this regard, stone dust can be an economic alternative to the river sand. In the present study mechanical properties of the recycled coarse aggregate concrete with stone dust are compared with that of conventional concrete made of natural aggregates and river sand. M20 and M30 grades of concrete are designed as per IS 10262-2009 and IS 456-2000. Tests were conducted on cubes, cylinders and prisms to study the strength of concrete made of stone dust and recycled aggregate. Recycled coarse aggregate (RCA) used in this work is obtained from crushing old tested concrete cubes to replace the natural coarse aggregates (NCA) in different proportions. Experiments were conducted using 0%, 30%, 60%, 90% replacement of natural coarse aggregate with recycled coarse aggregate and 0%, 50%, 100% replacement of fine aggregate with stone dust. Concrete specimens were tested after 7 and 28 days of curing. Results shows that the concrete with 100% stone dust and upto 60% recycled coarse aggregate qualifies as a substitution of conventional concrete**

***KeyWords*: Recycled aggregate, stone dust, compressive strength, split tensile strength and flexural strength.**

I. INTRODUCTION

In the world of construction, concrete, like other materials is playing an important role in development. Concrete is a composite material which is a mixture of cement, fine aggregate, coarse aggregate and water. The major constituents of which is natural aggregate such as gravel, sand, alternatively, aggregates such recycled aggregate, manufactured sand furnace slag, fly ash, expanded clay, broken bricks and stone dust may be used where appropriate. It has many advantages including low cost, general availability of raw material, adaptability, low energy requirement and utilization under different environmental conditions. It is most common practice in all over the world that most of the materials are being recycled to save the natural resources and environment. Concrete is such a costly material but waste concrete is only being used as a landfill material instead of recycling the concrete as a recycled concrete aggregate (RCA) to use for the construction purposes. There is need to improve its properties like workability, strength and durability. The research has been executed in order to utilize smaller quantities of fine aggregate and coarse aggregate, also to conserve our natural resources and reduce the cost of construction. The goal of sustainable construction is to reduce the environmental impact.

II. LITERATURE REVIEW

Mamery Serifou, et al., (2013) It is observed that the compressive strength decreases gradually with increase of the percentage of recycled aggregates. This relationship can be approximated by a polynomial function with $R2$=0.92. The substitution of natural aggregates with 25%, 50%, and 100% of recycled aggregates decreases the compressive strength by about 15%, 25%, and 32%, respectively. The decrease in tensile strength is by 18% when 100% of the recycled aggregates are incorporated.

Seismic Response Study of Multi-Storied Reinforced Concrete Building with Fluid Viscous Dampers

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***Abstract*-Damping plays an important role in design of earthquake resistant structures. It reduces the response of the structure when they are subjected to lateral loads. There are many different types of dampers in use. In the present study Fluid Viscous Dampers (FVD) are used to evaluate the response of RC buildings. One of the important properties of structure is to receive the effect of lateral loads and transfer it to the foundation. Since the lateral loads acting on a structure due to earthquake are dynamic in nature, they cause vibrations in it. In order to handle these vibrations, fluid viscous dampers are used in the design of earthquake resistant structures. In this study, structures of square and rectangular shaped floor plan with columns of square and rectangular shaped cross- sections are analyzed. ETABS 2015 software is used for finding the response of the structures with and without FVD by performing push over and time history analyses. It is observed that the performance of the structures with square columns is better in terms of response when compared to the structures with rectangular columns irrespective of the shape of floor plan. In Time History analysis, up to 90% decrease in the time period is observed when FVD's are used. FVD-250 reduced the base shear of the structures by 70%. Displacements of top storey are minimized by 90% with the use of FVD's. Hence FVD's can be used in RC multistoried structures to reduce the response effectively.**

Keywords: **Earthquake resistant structures, Fluid Viscous dampers (FVD), ETABS, push over analysis and time history analysis.**

I. INTRODUCTION

The viscous fluid dampers (VFD) are used to control response of the structures. They are used based on different construction technologies in order to decrease the structural response due to the seismic excitation. The devastative effects of the recent earthquakes such as Northridge earthquake (1994), Kobe earthquake (1995), and Taiwan earthquake (1999) on the buildings of cities adjacent to fault and with regard to the close location of many of the cities of India to the active faults indicate the significance of the research.

In last few years, many essential developments in seismic codes have turned up. Seismic isolation and energy dissipation are widely recognized as effective protection techniques for reaching the performance objectives of modern codes. However, many codes include design specifications for seismically isolated buildings, while there is still need of improved rules for energy dissipation protective systems. [1]

II. LITERATURE

Y. Zhou, et al.,2012 [2] "A practical design method for reinforced concrete structures with viscous dampers" shown how compared to the retrofitting technology of seismic isolation, the installation of viscous dampers to those existing buildings are more realistic because of easy construction. However, the design of viscous dampers, which provides a high level of damping in a structure, was relatively new application in China for a well-established and proven technology in other seismically active regions in the world.

V. Umachagi, et al.,2013, [3] "Applications of dampers for vibration control of structures: An overview" has briefly explained that viscous dampers works based on fluid flow through orifices. Viscous damper consists viscous wall, piston with a number of small orifices, cover filled with silicon or some liquid material like oil, through which the fluid pass from one side of the piston to the other.

Liya Mathew & C. Prabha, 2014, [4] published "Effect of fluid viscous dampers in multi-storied buildings" in which they mentioned that special protective systems have been developed to enhance safety and reduce

STUDIES ON STRENGTH CHARACTERISTICS OF SELF-CURING CONCRETE

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Abstract
Today concrete is most widely used construction material due to its good compressive strength and durability. Depending upon the nature of work the cement, fine aggregate, coarse aggregate and water are mixed in specific proportions to produce plain concrete. Plain concrete needs congenial atmosphere by providing moisture for a minimum period of 28 days for good hydration and to attain desired strength. Any laxity in curing will badly affect the strength and durability of concrete. Self-curing concrete is one of the special concretes in mitigating insufficient curing due to human negligence paucity of water in arid areas, inaccessibility of structures in difficult terrains and in areas where the presence of fluorides in water will badly affect the characteristics of concrete. The present study involves the use of shrinkage reducing admixture polyethylene glycol (PEG 400) in concrete which helps in self-curing and helps in better hydration and hence strength. In the present study, the effect of admixture (PEG 400) on compressive strength, split tensile strength and modulus of rupture by varying the percentage of PEG by weight of cement from 0% to 2% were studied both for M20 and M40 mixes. It was found that PEG 400 could help in self-curing by giving strength on par with conventional curing. It was also found that 1% of PEG 400 by weight of cement was optimum for M20, while 0.5 % was optimum for M40 grade concretes for achieving maximum strength without compromising workability.

Index Terms: *Self-curing concrete; Water retention; Relative humidity; Hydration; Absorption; Permeable pores; Sorptivity; Water permeability*

1. INTRODUCTION

Proper curing of concrete structures is important to meet performance and durability requirements. In conventional curing this is achieved by external curing applied after mixing, placing and finishing. Self-curing or internal curing is a technique that can be used to provide additional moisture in concrete for more effective hydration of cement and reduced self-desiccation.

1.1 Methods of self curing

Currently, there are two major methods available for internal curing of concrete. The first method uses saturated porous lightweight aggregate (LWA) in order to supply an internal source of water, which can replace the water consumed by chemical shrinkage during cement hydration. The second method uses poly-ethylene glycol (PEG) which reduces the evaporation of water from the surface of concrete and also helps in water retention.

1.2 Mechanism of Internal Curing

Continuous evaporation of moisture takes place from an exposed surface due to the difference in chemical potentials (free energy) between the vapour and liquid phases. The polymers added in the mix mainly form hydrogen bonds with water molecules and reduce the chemical potential of

EFFECT OF RECYCLED AGGREGATE ON FRESH AND HARDENED STATE PROPERTIES OF SELF-COMPACTING CONCRETE

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Abstract

Concrete is the most widely used construction material in which Aggregates take maximum share. This poses the problem of acute shortage of aggregate and scouring of Granite Quarry. At the same time, the quantity of recycled Concrete aggregates from old Construction Demolished waste is piling up in many areas. If it is possible to use this RCA in fresh concrete by partial/complete replacement of Natural Coarse aggregates, then this will not only save the cost of construction at the same time it will solve the problem of disposal of this CDW waste. Therefore, the objective of this research work is to develop sustainable self Compacting Concrete (SCC) of various grades using Recycled Concrete Aggregate (RCA), fly ash etc. This paper discusses the fresh and hardened state properties of SCC of M30 grade using Natural and Recycled Concrete Aggregates. Quantification and Characterization was done using Modified Nan Su Mix design analysis.

Keywords*: Self Compacting Concrete (SCC), Recycled concrete aggregates (RCA), Fresh Properties, Mechanical Properties, Modified Nan Su Method.*

Introduction

The term Self-Compacting Concrete (SCC) refers to a "new" special type of concrete mixture, characterized by high resistance to segregation that can be cast without compaction or vibration. It flows like "honey", de-aerates, self-compacts, and has nearly a horizontal concrete level after placing. Products made with SCC have an excellent finish, and are virtually free of bug holes The basic components of the mix composition of SCC are the same as those used in conventional concrete. However, to obtain the requested properties of fresh concrete in SCC, a higher proportion of ultrafine materials and the incorporation of chemical admixtures, particularly an effective superplasticizer, are necessary. Because of this, self-compatibility can be largely affected by the characteristics of materials and mix proportion. No standard or all-encapsulating method for determining mixture proportions currently exists for SCC. However, many different proportion limits have been listed in various publications. Therefore, a rational mix-design method for NASCC and RASCC using variety of materials is necessary. The proposed Modified Nan Su Mix design of SCC must satisfy the criteria on filling ability, pass ability and segregation resistance.

Mix Design Method: Initially EFNARC first approach for Modified Nan Su Mix design is used, and then the proportions of materials modified after the evaluation by fresh tests was done. The modifications are made according to EFNARC guidelines.

Sustainable Design: Sustainability in general terms is to create an economic system with enhanced performance with long term safety. Sustainability is the one which mainly focuses

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Effect of Plan Shape on the Wind Pressures Onbuildings- A CFD Approach

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***Abstract*-- Lateral loads i.e. wind load, seismic load, govern the design of tall buildings and their computation is of paramount importance for the efficient analysis of structures. For very tall buildings, wind loads are more predominant than seismic loads and the present wind load code IS 875 (PART-3) provides provisions for design pressure and force coefficients for some standard shapes. But with the present trend of adopting complex geometries for buildings, the present specifications are inadequate for the computation of wind loads. For such cases, wind tunnel testing, which is required to generate equivalent atmospheric turbulence properties and boundary layer flow inside the wind tunnel can be adopted, but is too costly and time consuming. In such a scenario, computational fluid dynamics, an analytical tool comes handy and provides a reasonable and economical solution.**

Computational Fluid Dynamics, popularly known as CFD, basically involves obtaining numerical solution for the fluid problems often governed by Navier Stoke equations. It needs high speed computing systems and efficient algorithms. In the present work, an attempt is made to predict the wind pressures on buildings of various shapes with various floor heights and make a comparative study. K-epsilon turbulence model is considered for the analysis and software ANSYS - FLUENT is used for CFD analysis.

***Keywords*-- Computational fluid dynamics (CFD), Boundary layer, K-epsilon, UDF- Velocity profile.**

I. INTRODUCTION

Wind is a phenomenon of great complexity because of the many flow situations arising from the interaction of wind with structures. Wind is composed of a multitude of eddies of varying sizes and rotational characteristics carried along in a general stream of air moving relative to the earth's surface. These eddies give wind its gusty or turbulent character. The gustiness of strong winds in the lower levels of the atmosphere largely arises from interaction with surface features. The average wind speed over a time period of the order of ten minutes or more tends to increase with height, while the gustiness tends to decrease with height.

The characteristics of wind pressures on a structure are a function of the characteristics of the approaching wind, the geometry of the structure under consideration, and the geometry and proximity of the structures upwind. The pressures are not steady, but highly fluctuating, partly as a result of the gustiness of the wind, but also because of local vortex shedding at the edges of the structures themselves. The fluctuating pressures can result in fatigue damage to structures, and in dynamic excitation, if the structure happens to be dynamically wind sensitive. The pressures are also not uniformly distributed over the surface of the structure, but vary with position.

The purpose of the present study is to investigate the dynamic behaviour of tall structures of various shapes when subjected to wind. For the simulation part domain size and mesh size influences the accuracy of the result. The boundary conditions and wall condition around the bluff body should be considered. The main focus of the present study is to reduce the unsteadiness of wake region around the structure, which creates high pressures, by considering the appropriate shape of the structure. Aerodynamic forces on tall building models with same area were using the pressure contours generated on various faces of models are calculated. [3]

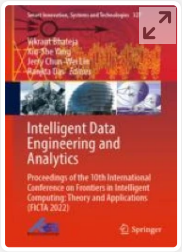
II. OUTLINE OF MODELS CONSIDERED

A. Configuration of tall building models:

The tall buildings used for the experiments are square, circle, ellipse and parabolic shapes. The pressure contours are generated for various angles of attacks like 0, 90 and 180. The height of the structures considered are 150m, 195m and 240m.Selection of models were based on the aerodynamic nature of the buildings.

B. Computational Fluid Dynamics

Computational fluid dynamics (CFD) is a branch of fluid mechanics that uses numerical analysis and algorithms to solve and analyse problems that involve fluid flows.



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Lightweight Privacy Preserving Framework at Edge Layer in IoT

Kavita Agrawal, Suresh Chittineni, P. V. G. D. Prasad Reddy, K. Subhadra & Elizabeth D. Diaz

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Abstract

The Internet of Things is helping us to make our lives comfortable. IoT devices used here are

Privacy preserving at the edge layer in the Internet of Things is a challenging task. We proposed a lightweight privacy preserving framework that uses the concept of blockchain, zero knowledge proof algorithm, principal component analysis, and digital signatures. Here for the mining process in blockchain, Trust concept is being used instead of Proof of Work (POW) and Proof of Stake (POS) as it consumes fewer resources and our edge layer is resource constrained. This could be a feasible solution and can be deployed at the edge layer in the Internet of Things for preserving privacy.

Keywords

PCA **Zero knowledge proof** **Trust**

Blockchain **Edge computing** **POW**

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Optimal Transportation System based on Adaptive Federated Learning Techniques for Healthcare IoV (HIoV)

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Abstract- The Healthcare Internet of Vehicles (HIoV) significantly impacts many aspects of modern life. Various IoV services and applications are evolving on a daily basis. Simultaneously, Artificial Intelligence (AI) is a rapidly developing technology. AI improves system execution. Machine Learning (ML) is a subdomain of AI. ML is concerned with extracting knowledge from data. Federated learning (FL) is a subset of ML. FL intends to train an ML programme. In the case of ML, the training data must be centralized. Because IoV works in a highly distributed manner, this is considered a disadvantage in an IoV environment. FL is best suited for this task because it combines the learning of multiple devices running different applications in a single Internet of Things (IoT) environment. These can be both dependent and independent. Before applying any rule, the FL must unify the results of disparate applications. This chapter will cover the major obstacles to FL for HIoV applications.

Keywords: IoV, Healthcare, IoT, AI, ML, Distributed.

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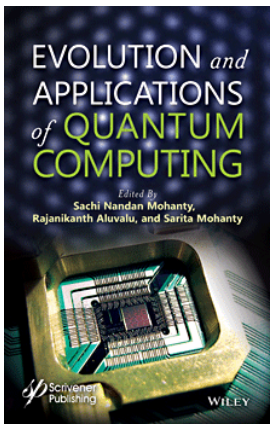

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Description
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One Line Description

The book is about the Quantum Model replacing traditional computing's classical model and gives a state-of-the-art technical overview of the current efforts to develop quantum computing and applications for Industry 4.0.

Audience

The book will be very useful for researchers in computer science, artificial intelligence and quantum physics as well as students who want to understand the history of quantum computing along with its applications and have a technical state-of-the-art overview.

Description

A holistic approach to the revolutionary world of quantum computing is presented in this book, which reveals valuable insights into this rapidly emerging technology. The book reflects the dependence of quantum computing on the physical phenomenon of superposition, entanglement, teleportation, and interference to simplify difficult mathematical problems which would have otherwise taken years to derive a definite solution for. An amalgamation of the information provided in the multiple chapters will elucidate the revolutionary and riveting research being carried out in the brand-new domain encompassing quantum computation, quantum information and quantum mechanics. Each chapter gives a concise introduction to the topic.

The book comprises 18 chapters and describes the pioneering work on the interaction between artificial intelligence, machine learning, and quantum computing along with their applications and potential role in the world of big data. Subjects include:

• Combinational circuits called the quantum multiplexer with secured quantum gate (CSWAP);

• Detecting malicious emails and URLs by using quantum text mining algorithms to distinguish between phishing and benign sites;

• Quantum data traffic analysis for intrusion detection systems;

• Applications of quantum computation in banking, netnomy and vehicular ad-hoc networks, virtual reality in the education of autistic children, identifying bacterial diseases and accelerating drug discovery;

• The critical domain of traditional classical cryptography and quantum cryptography.

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