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ICSESS 2016

2nd International Conference on Science, Engineering and the Social Sciences

CONSOLIDATING THE FUTURE
Education, Management, Technology

May 29 – June 1, 2016

B12, Faculty of Built Environment,
Universiti Teknologi Malaysia Johor Bahru, Malaysia

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Preface

On behalf of the Central Working Committee, it is a great pleasure for me to welcome all colleagues to 2nd International Conference on Science, Engineering and the Social Science (ICSESS 2016) held at Universiti Teknologi Malaysia, Johor Bahru, Malaysia from May 29 - June 1, 2016.

The conference is organized by the International Students Society- Nigeria (ISS-Nigeria), Universiti Teknologi Malaysia with the main theme: **Consolidating the Future; Education, Management and Technology**The main aim of organizing this conference is to provide a platform for researchers to showcase their research findings and most importantly, to further encourage interactions amongst researchers to boost networking and collaborations in the field of sciences, engineering, the social sciences and humanities. A total of 256 papers were received. 162 papers were accepted for the oral presentations while 19 were selected for poster presentation. These accepted and presented papers will undergo a second round of review for publication in a SCOPUS-indexed journal known as **Indian Journal of Science and Technology**

In the course of the conference, four keynote speeches will be delivered by four distinguished scholars in the field of research and development. Conference presentations (both oral and posters) have been grouped according to the following sub-themes: Agriculture Computer and Sciences, Earth and Environmental Sciences, Biosciences Biomedical and Medical Engineering, Engineering as well as Humanity Management Education and the Social Sciences

Once again, on behalf of the conference organizing committee, a very warm welcome to all ICSESS 2016 participants, and I hope this conference will have a lasting impact in your careers as researchers and academics.

Best Regards.

Dr. Yakubu Aminu Dodo
Chairman
ICSESS 2016 Central Working Committee

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2nd International Conference on Science, Engineering and Social Sciences (ICSESS 2016)
29th May– 1st June, 2016, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

REVIEW ON CREEP OF PLAIN AND FIBROUS CONCRETE

OGUNBODE EZEKIEL BABATUNDE [1, 2*], RAZAVI MEISAM [1], JAMALUDIN MOHAMAD YATIM [1], ISHAK MOHD YUNUS [1], RAZAVI MASAUD [1]

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ABSTRACT. An appraisal of topical advancements in the exploration of creep performance in plain and fibrous concrete (FC) was done in this paper. A comparison of plain concrete and fibrous concrete creep performance was carried out as reported in the literature. This is aimed at quantifying the effect of fibre inclusion on creep behaviour of concrete when exposed to sustained load. Reviewing the literature, it was gathered that insertion of fibres in concrete can be of advantage to creep performance as it reduces the creep of concrete composite. Despite the elaborated study on creep of concrete, literature holds it that much is still needed to be done on fibrous concrete. However, publication on creep behaviour of biofibrous concrete is very limited.

Keywords.Biofibrous; Composite; Creep; Fibrous concrete; Plain concrete

INTRODUCTION

Creep of concrete is both a desirable and an undesirable phenomenon. It is desirable as it imparts a degree of necessary ductility to the concrete. On the other hand, creep is often responsible for excessive deflections at service loads, which can result in the instability of arch, shell structures cracking, creep buckling of long columns and loss of prestress[1]. Frequently the detrimental results of creep are more damaging to non-load-bearing components associated with the structure, such as window frames, cladding panels and partitions, than they are in the structure itself [2]. Often, damaged structures are either shut down or undergo extensive repairs long before the end of their intended design life, resulting in significant economic consequences. Creep strain is generally associated with its detrimental effects.

CREEP OF PLAIN CONCRETE

Plain concrete has at least two fundamental differences in comparison with many other common structural materials. Firstly, unlike the metals, concrete with its cement gel, crystalline products of hydration, water, unhydrated cement and aggregate is heterogeneous and when reinforcement is present, anisotropic as well. The second difference arises from the fact that the properties of concrete change with time and are greatly affected by temperature and relative humidity, and therefore by the environment. The shrinkage and creep in concrete is commonly defined by the free shrinkage strain and creep coefficient and they are very much dependent on the above mentioned variables. Ever since time dependent phenomena in concrete have become recognized, there have been an overwhelming number of publications on the subject[3,4,5]. In structural design, the importance and significance of the physical properties of concrete are recognized as being a possible cause of cracking. They also influence the deformations and are responsible for the transference of load from concrete to steel in compression members, while the structure is in service.

CREEP OF FIBROUS CONCRETE

The research regarding the creep of Fibrous concrete is still inadequate if compared to that of plain concrete. It is required to understand the creep behaviour of FC, so that this time dependent property of concrete can be included in the design guidelines. A group of researchers[6] substantiated that creep deformation of concrete in compression is reduced by fibres. Also Swamy and Theodorakopoulos [7] explained that creep deformation owing to bending stresses on uncracked specimens experience reduction when fibre is included in the concrete.

It should be noted that there exists a substantial quantity of contradictory information in the literature on the action and influence of fibre regarding the creep behaviour of cementitious materials [8]. Velasco[9] opined that the addition of fibres in concrete results in higher creep. This negates the general consensus and outcome of most researchers [10, 11] who put the result of their research succinctly that the addition of fibres can reduce creep in concrete. However, most of the studies focused on the creep of concrete on compressive creep. Therefore, compressive creep was significantly

investigated using a large amount of data. Meanwhile, experimental data on concrete creep under tension are very scarce. Tensile creep could perform an important role in reducing the restrained shrinkage stress. Therefore, considering tensile creep precisely will improve the cracking potential of concrete for the long term[8].

Recently, the use of Natural/Bio fibre to replace steel fibre, polypropylene fibre and other common fibres in concrete is being advocated as it is economical, environmentally friendly, non-corroding, easily recycled and demonstrate low density[12]. Though there is limited or no publications on creep of biofibrous concrete (kenaf, sisal, hemp, etc.). Much remains unknown about the creep of Natural fibrous concrete. Therefore, a need to study the influence and performance of biofibrous materials in concrete is highly required.

CONCLUSION

Conclusively, researchers have succinctly put it that fibre inclusion in concrete provides a positive contribution to creep performance of concrete. However, it is difficult to determine the quantitative nature of the positive contribution of fibre inclusion in concrete to creep behaviour. Though, the presence of natural fibres has not yet been proved to enhance the life of concrete creep either under compressive, tensile and flexural creep loading, when compared to steel fibre, and polypropylene fibre.

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