GURU NANAK INSTITUTE OF TECHNOLOGY

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Date: 20-12-2015

DEPARMENT OF CIVIL ENGINEERING

CIRCULAR

The Department of civil engineering is organizing a one day Workshop on 'Advancement in concrete technology" on 24th dec 2015.

In this connection I request you to circulate this among Teaching Staff and students about the seminar date and venue.

PRINCIPAL

HOD-CIVIL

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Date: 27-Dec-2015

Report of Seminar

On

ADVANCEMENT IN CONCRETE TECHNOLOGY

Date of seminar 24-Dec-2015

Name of the expert: Mr. Ramesh raja

Concrete is an essential material used in the construction of different types of structures. It has played a significant role in almost all aspects of human civilization. Residential buildings, skyscrapers, large office and commercial complexes, are all built using one type of concrete or the other. This hardy material is extensively used in making bridges, highways, stadiums, irrigation works, airport tarmacs, pavements, and countless prefabricated products.

Need for developing new range of concrete

Although concrete is a tough material yet it has its own set of weaknesses. Over a period of time concrete gets damaged by water and moisture. Water eats into the lime component of the concrete. This causes microscopic channels to develop that eventually widen with more contact with moisture and crack concrete. Temperature variations, stress, and vibrations cause it to fracture. Many a times the assortment of materials that goes into the making of concrete does not produce the required resilience. All these factors have forced researchers all over the world to improve the quality, strength, and durability of concrete. The main focus area of research is on the development of a new generation of concrete that is better equipped to withstand natural elements, is resistant to cracking, and is long-lasting.

Self healing concrete

This next-generation concrete does not break off like conventional concrete does. However, it usually bends due to overuse or under stressful conditions and at the most develops minute fissures. Nevertheless, these cracks are easily taken care of by the reaction that takes place between the exposed material and natural elements.

Calcium carbonate, a strong substance, is automatically created when the open surfaces of these tiny crevices come in contact with rainwater and with carbon dioxide present in the air. Once it is created, calcium carbonate fills and effectively seals of the cracked areas of the concrete making it as sturdy as before. The elasticity of this matter is drawing the attention of engineers who want to use it as a viable replacement for expansion joints required to stabilise bridges.

The applications of this new type of concrete are immense and it is bound to leave its mark on the construction industry across the globe.

Quality control with infrared thermograph

Thermal imaging technology can easily determine the quality of freshly prepared concrete at construction sites. It is better to detect inconsistencies in the making of concrete than to use substandard matter and wait for disasters to happen. Thermographs help to monitor the critical process of concrete curing of various prefabricated concrete products under controlled conditions. Further, this technology is employed to establish the effect of temperature on freshly poured concrete at a construction site.

High-performance fiber reinforced varieties of concrete

There is a never ending demand for creating a construction material that is highly impervious to water, resists cracks, and is robust and long-lasting. These qualities can be achieved by infusing concrete with a host of microscopic fibres. The hardiness and durability of concrete is enhanced with the use of fibres made out of steel, glass, cellulose, nylon, polypropylene and so on.

These fibres reduce the occurrence of shrinking and cracking in concrete. Further, fibres improve the strength and water-resistant capabilities of concrete exponentially thereby extending and ensuring its longevity.

An Assortment of additives

Constantly new matter is being tried for making new-generation concrete. One such variety is developed by mixing cement with slag obtained from blast furnaces. Another type makes use of fly ash, an industrial by-product. Increased water-resistance is possible in concrete by making use of raw material traditionally used for manufacturing porcelain articles.

Scientists working on nano particles are also striving hard to increase the toughness of concrete matter and its additives. In this regard, researchers have already achieved success by improving the behaviour of nano particles found in cement by changing their structure. This adds solidity to both cement and concrete.

One for the moon

Mankind is looking at extraterrestrial bodies not only for research but also as a potential future home. In this context, the moon is the first and the foremost choice for setting up human colonies. Here also the role of concrete is crucial. Study is underway to develop a construction material that will facilitate use of moon dust for building structures on the lunar surface.