KKR & KSR INSTITUTE OF TECHNOLOGY & SCIENCES
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PRAJWALAM

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A NEWSLETTER OF CIVIL ENGINEERING DEPARTMENT

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EDITOR'S VOICE:

The problem of transporting oil from the field to oil refineries is one of the key problems in oil industry. For continental countries, this problem is solved through construction of well-developed pipeline network that were and are being constructed in Europe, Asia, the USA and Africa.Natural striving to increase flow velocity and construction of big diameter pipes causes onset of turbulence that spikes hydrodynamic losses and decreases effectiveness of energy consumption. Therefore, there is also a natural tendency to suppress turbulence in various ways. It appears that the most effective technique is the so-called Toms effect well-known (Toms, 1949). Its essence is that addition of extremely low concentrations of certain agents into a low-viscosity medium (water, organic liquids) dramatically reduces hydrodynamic resistance to flow within the range of large Reynolds numbers. In general, the role of such agents is performed by high molecular weight (MW) polymers which are soluble in a fluid.

As a result of injection of Drag Reducing Agents (*DRA*) in the amount of about 10 ppm, flow capacity in oil pipelines increases essentially - for tens of percent - thus specific pumping energy consumption decreases.The main factor that impacts drag reducing (DR) activity is the size of macromolecular coil in solution: the greater it is, the more efficient DRA. The main contributors to that size are mentioned above - MW and high solubility.By means of microdoses of polymer, it is possible to 'enlarge' bottlenecks of a pipeline network, replenish delivery volumes after a forced downtime, react to season increase in consumption of one or another petroleum product. DRA can help to reduce time required for tanker loading and offloading. Besides it can be considered as additional energy material to response to pumping power shortages in one region or anotherTechnique of study of the hydrodynamic drag reduction effect can be divided into two groups. Turbulent flow characterized by averaged values as a whole is the object of research of the first group. For these purposes, turbulent rheometers and hydrodynamic benches are used to measure flow rate, pressure drop, wall shear stress, and wall shear rate from which liquid drag coefficient and the value of DR in the presence of different DRA are calculated.

ABOUT DEPARTMENT :

Civil engineering is a professional engineering discipline that deals with the design, construction and maintenance of the physical and naturally built infrastructure for fulfillment of Basic Needs of human race including Transportation, Communication, Energy production, Religious, Cultural, Sports and Community and Social and Developmental activities like bridges, roads, canals, dams and buildings.Department is the foremost in imparting Civil Engineering education in KITS. Well qualified and experienced faculty is one of the salient feature of the department and acute care is taken to ensure that students acquire essential engineering concepts with in-depth understanding In addition to, the civil department is well equipped with required departmental laboratories with tools and equipments.

Vision of the Department:

Create a congenial learning environment for imparting knowledge, skills and values.

Mission of the Department:

DM1 Providing state of the art facilities for learning and practicing.

DM2 Providing additional skills and training to meet the needs of the industry.

DM3 Inculcating professional and ethical values and serve the industry, society and environment.

GUEST LECTURE

Guest lecture on **Advances in Concrete Materials**

The aim of this Guest Lecture is to tell the students the importance of "Advances in Concrete Materials" and the role of civil engineers at different levels. The role of Concrete Production and its future scope was dealt to motivate the students towards upgrading trends in construction sector at the Mix design & execution level.

About Guest Lecture:

Developing and maintaining world's infrastructure to meet the future needs have industrialized and developing countries are necessary to economically grow and improve the quality of life. The quality and performance of concrete plays a key role for most of infrastructure including commercial, industrial, residential and military structures, dams, and power plants.

Advances in Concrete Technology we should have to maintain Concrete Materials, Workability of Concrete, Concrete Mixture Proportioning, Concrete Mechanical Properties, Concrete Durability Properties, Concrete tests, Concrete Construction Control and to meet advancements made in concrete technology we should have to use latest technologies and various applications of concrete technologies like Use of recycled materials in concrete , High Performance Concrete, Air Void Analyzer, Concrete Composition Technologies, Self compacting Concrete.

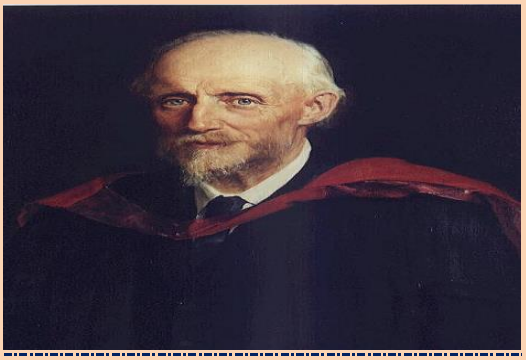
Details in Guest lecture session

A. Concrete materials: The development of chemical admixtures has revolutionized concrete technology in the last fifty years. The use of air entraining admixtures, accelerators, retarders, water reducers and corrosion inbitititors are commonly used for bridges. The use of Self-compacting concrete is beginning (mostly used for precast elements). Shrinkage reducing admixtures are rarely used for bridges. Supplementary cementitious materials e.g. fly ash, ground granulated blast furnace slag and silica fume are routinely used.
B. Workability of Concrete: Workability of fresh concrete depends on its rheological properties. This rheological behavior is defined by two characteristics of the concrete, i.e. yield stress and plastic viscosity. Yield stress is the effort needed to initiate movement of the fresh concrete, and correlates well with slump. Plastic viscosity is the flow characteristics of the concrete while moving and for low stiffness concretes can be determined by various rheometers currently available.
C. Concrete mixture proportioning: Continuous gradation and consideration of workability during laboratory testing are slowly gaining acceptance in practice.

D. Concrete mechanical properties: Higher strength concrete for bridges is commonly used for columns and beams. Higher strength concrete usually provides higher abrasion resistance and where appropriate this is considered in the bridge deck and pavement designs.

E. Concrete tests: The utilization of advanced test procedures e.g. various shrinkage tests, air-void analyzer and non-destructive tests have become widespread. Workability test for stiff concrete mixes is being evaluated by several organizations.

F. Concrete construction control : In-situ concrete testing, effective curing practices and utilization of computer software to monitor concrete strength development as well as minimizing cracking potential are used on major transportation projects



OSBORNE REYNOLDS

Osborne Reynolds (23 August 1842 – 21 February 1912) was an innovator in the understanding of fluid dynamics. Separately, his studies of heat transfer between solids and fluids brought improvements in boiler and condenser design. He spent his entire career at what is now the University of Manchester Reynolds most famously studied the conditions in which the flow of fluid in pipes transitioned from laminar flow to turbulent flow. In 1883 Reynolds demonstrated the transition to turbulent flow in a classic experiment in which he examined the behaviour of water flow under different flow rates using a small jet of dyed water introduced into the centre of flow in a larger pipe.

The larger pipe was glass so the behaviour of the layer of dyed flow could be observed, and at the end of this pipe there was a flow control valve used to vary the water velocity inside the tube. When the velocity was low, the dyed layer remained distinct through the entire length of the large tube. When the velocity was increased, the layer broke up at a given point and diffused throughout the fluid's cross-section. The point at which this happened was the transition point from laminar to turbulent flow.

Reynolds published about seventy science and engineering research reports. When towards the end of his career these were republished as a collection they filled three volumes. For a catalogue and short summaries of them .Areas covered besides fluid dynamics included thermodynamics, kinetic theory of gases, condensation of steam, screw-propeller-type ship propulsion, turbine-type ship propulsion, hydraulic brakes, hydrodynamic lubrication, and laboratory apparatus for better measurement of Joule's mechanical equivalent of heat.

One of the subjects that Reynolds studied in the 1880s was the properties of granular materials, including dilatant materials. In 1903 appeared his 250-page book The Sub-Mechanics of the Universe, in which he tried to generalise the mechanics of granular materials to be "capable of accounting for all the physical evidence, as we know it, in the Universe". His aim seems to have been to construct a theory of aether, which he considered to be in a liquid state. The ideas were extremely difficult to understand or evaluate, and in any case were overtaken by other developments in physics around the same time