

ASPIRE

INSPIRING ENGINEERS

CIVIL
ENGINEERING

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DEPARTMENT OF
CIVIL ENGINEERING

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S.R.K.R ENGINEERING COLLEGE

· VISION ·

Sagi Rama Krishnam Raju Engineering College will be offering Engineering and Technology Programs of choice, where parents want to send their children, where students want to learn, where employers seek Quality Engineers and Technologists where Industry and Government find Technological Innovations

· MISSION ·

Eminence in Technical Education through the quality of programs, teaching and research with social relevance

DEPARTMENT OF CIVIL ENGINEERING

· VISION ·

To Lead Academics and Research in Civil Engineering Globally

· MISSION ·

To Improve high-quality education and make the students Ethical, World-Class Professionals

To improve Skills of both staff and students with opportunities to innovate and explore knowledge through research projects and consultancy

To inculcate the feeling of present needs in students and evoke in them a responsibility to serve the society better

MESSAGE...



Nurturing creativity and inspiring innovation are two of the key elements of successful education, and a magazine is the perfect amalgamation of both .It harnesses community and the essence of their inspired imagination in the most brilliant way possible.

This provides an intersection of great challenge and great opportunity for the students to review their efforts and to analyze their achievements in research and development technology is evolving at a dizzying rate .So the objective of the department is to prepare students for a successful carrier in industry which is essential.

In the modern world of construction where we witness every day as a day of a new construction method, material and skill, it is very much important to forward the same to the students by means of latest teaching aids and by preparing an equal and proper learning platform.

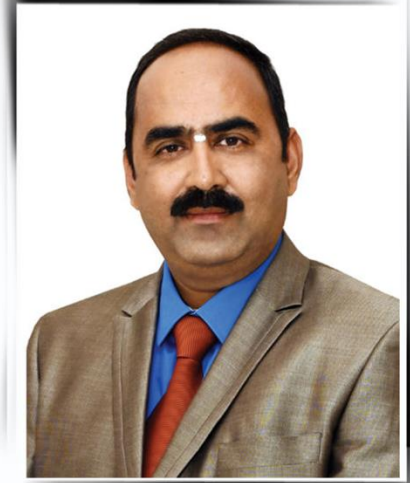
I congratulate the team of students and the faculty for their tireless efforts that they have come to action in the form of the magazine.

Sri.S.Prasada Raju

President

S.R.K.R. ENGINEERING COLLEGE

MESSAGE...



Today, the world is undergoing huge changes in technological revolution, population growth and environmental concerns all these changes create unique challenges for the Civil Engineers. The next decade will be most creative, demanding and rewarding times for Civil Engineers.

The department of Civil Engineering with its multifaceted faculty, maintains its strong links with the construction industry by engaging in consultancy activities. The students here are encouraged to extra-curricular and co-curricular activities which are essential for personality development, nurturing of team spirit and development of organizational skills.

I do appreciate and applaud the editorial team for their successful completion of this difficult task of putting together the myriad thoughts and dreams of our students and faculty.

DR. G. Pardha Saradhi Varma

Principal

S.R.K.R. ENGINEERING COLLEGE

MESSAGE...



Civil Engineering being one of the core and most fundamental engineering branches is fully dedicated towards the same teaching and learning philosophy of the foundation.

We take it our moral and social responsibility to imbibe the state of art technological information to be forwarded to the student fraternity of Civil Engineering.

The department is equipped with modern equipments and highly advanced laboratories. Students enjoy the regular industrial visits based on their curriculum and scope for the study.

Department of Civil Engineering is spearheaded by highly competent, dedicated well qualified and experienced faculties. The department is providing awareness for the students to qualify themselves as good Civil Engineers and provide their contribution to the development of society and nation.

We aim towards making every student from foundation to be a true asset for the nation and a noble human being for the world.

Dr. M. Jagapathi Raju

Head of Civil Department
S.R.K.R. ENGINEERING COLLEGE

SRI MOKSHAGUNDAM VISVESVARAYA



Sri Mokshagundam Visvesvaraya also spelled as Sir Mokshagundam Visweswarayya, popularly known as Sir MV (15 September 1861 – 12 April 1962) was an Indian Civil Engineer, statesman and the 19th Diwan of Mysore, who served from 1912 to 1919. He received India's highest honour, Bharat Ratna, in 1955. He was knighted as a Knight Commander of the British Indian Empire (KCIE) by King George V for his contributions to public good. 15 September is celebrated as Engineers' Day in India, Sri Lanka and Tanzania in his memory. He is held in high regard as a pre-eminent Engineer of India.

He was Chief Engineer responsible for construction of Krishna Raja Sagara dam in North-West suburb of Mysore city and Chief Engineer of flood protection system for city of Hyderabad.

Visvesvarayya took a job as Assistant Engineer with the PWD of Bombay and later was invited to join Indian Irrigation Commission. He implemented an extremely intricate system of irrigation in Deccan. He had designed and patented a system of automatic weir water floodgates that were first installed in 1903 at Khadakvasla Reservoir near Pune. These gates were employed to raise flood supply level of storage in reservoir to highest level likely to be attained without causing any damage to dam. Based on success of these gates, the same system was installed at Tigra Dam in Gwalior and Krishna Raja Sagara (KRS) Dam in Mandya/Mysore, Karnataka. In 1906–07, Government of India sent him to Aden to study water supply and drainage systems. The project prepared by him was implemented in Aden successfully.

SRI MOKSHAGUNDAM VISVESVARAYA

Some of the honours and laurels conferred on Sir M. Visvesvaraya

- 1904: Honorary Membership of London Institution of Civil Engineers for an unbroken period of 50 years
- 1906: "Kaisari-Hind" in recognition of his services
- 1911: C.I.E. (Companion of the Indian Empire) at the Delhi Darbar
- 1915: K.C.I.E. (Knight Commander of the Order of the Indian Empire)
- 1921: D.Sc. - Calcutta University
- 1931: LLD - Bombay University
- 1937: D. Litt - Benaras Hindu University
- 1943: Elected as an Honorary Life Member of the Institution of Engineers (India)
- 1944: D.Sc. - Allahabad University
- 1948: Doctorate - LLD., Mysore University
- 1953: D. Litt - Andhra University
- 1953: Awarded the Honorary Fellowship of the Institute of Town Planners, India
- 1955: Conferred ' BHARATHA RATNA'
- 1958: "Durga Prasad Khaitan Memorial Gold Medal" by the Royal Asiatic Society Council of Bengal
- 1959: Fellowship of the Indian Institute of Science, Bangalore

DHOLA SADIYA

INDIA'S LONGEST RIVER BRIDGE



Location

The bridge is located in the State of Assam, usually referred to as upper Assam spanning 9.15 Km. This Beam bridge connects the North-East States of Assam and Arunachal Pradesh.

The bridge spans the Lohit River, a major tributary of the Brahmaputra river, from the village of Dhola in the South to Sadiya to the North. River Lohit flows in from China.

Construction

The construction of the bridge began in November 2011 at a project cost of Rs. 950 crores, the design is such that the bridge can withstand the movement of military tanks.

The construction was begun as a public private partnership with Navayuga Engineering Company, with an expected completion in 2015. However, due to construction delays and cost increases, the bridge's completion date was pushed into year 2017. On 10th of March 2017, Prime Minister Narendra Modi inaugurated the Dhola-Sadiya Bridge in Assam.

DHOLA SADIYA

INDIA'S LONGEST RIVER BRIDGE

Challenges

The location is fraught with unacceptable difficulties as mentioned below.

1. **High seismicity** - The country is categorized into four seismic zones based on expected intensity of earthquake. This location falls under zone 5 which has the maximum intensity.
2. **High wind speeds** - Though this is not a coastal zone, the wind velocities are high. Design wind speed is given as 50m/s.
3. **The current velocities in the river** are high-Design current velocity is given as 3m/s. Design of a structure in such conditions is difficult. But the subsoil consists of fine sand which is comparatively a favourable condition.

The Structural Stance

The bridge piers are founded on piles. There are four piles supporting each pier. For the sake of design of the foundation, the bridge is divided into two parts: proper river portion and flood plains. In the river portion there will be perennial flow of water and also it is deeper. Piles in this portion are subjected to higher forces than those in the flood plains. The flood plains will be dry during non-flood period. Scour of the bed in the river portion is deeper and current forces on piles will be higher. Besides, horizontal forces from seismic activity, braking of vehicles and temperature variations will induce heavier bending moments on piles.

Foundation:

Bored cast-in-situ piles have been employed for the foundation. Since forces on the river portion are higher, piles in that reach are of 1700mm diameter while that in the flood plains are of 1500mm.

Concrete used for piles had strength of 40MPa. Steel reinforcements for the pile had strength of 500MPa.

Super Structure:

The superstructure is of segmental box type. The box is externally post tensioned with high tensile strands. At the interface of the segments, shear keys are to be provided. For the sake of handling, the weight of the segments has to be limited to a minimum. They are to be longitudinally post tensioned.

The post tensioned concrete has strength of 50MPa while the high tensile steel strands have a tensile strength of 1860MPa.

DHOLA SADIYA

INDIA'S LONGEST RIVER BRIDGE

Abutment:

On the Dhola side, the height of the embankment is 10m. This was quite high. A box had to be designed to cater to the earth pressure. On the Sadiya side, the height of retention was 6.5m and so a cantilever retaining wall was designed.

Implication of high seismicity:

An important thing is that this force could act in any direction and so the structure should be designed for that eventuality. Seismic arresters resist the seismic loads and transfer them to the pier. They resist transverse and longitudinal seismic forces. Vertical reinforcements are used for transverse forces and stress bars have been utilized for longitudinal forces. Vertical seismic force could either be downwards or upwards. Downward force will be transferred to the soil. Gravity will act against upward forces.



Fig 1: Series of piers with reinforcement for seismic arrester



Fig 2: A single pier with seismic arrester re-bars

GROUND WATER PROBLEMS & SOLUTIONS

Ground water issues and solutions

Groundwater plays a major, if often unrecognized, role in both hydrologic and human systems. The majority of the world's drinking water probably comes from groundwater, and in the last half century. If largely ignored, boom in agricultural groundwater use that has provided improved livelihoods and food security to billions of farmers and consumers. However, increased use of ground water has also created problems and there are fears-sometimes challenged that the boom may soon turn to bust. This article reviews the recent literature on the geographic and temporal dimensions of groundwater use and the range of technological approaches which have been applied in attempts at its management. It then examines the key reasons the resource has proven so difficult to manage and concludes that, in many cases, the most promising solution may lie outside the groundwater sector and within a broader approach to Resource systems

Ground water issues

The pumping of groundwater for agricultural and urban use has formed new sources of discharge, removing groundwater at a faster rate than local recharge and resulting in declining water table. There is no question that groundwater use is higher than recharge in many parts of the world, including large parts of India. In many cases, the rate of water table decline is alarming.

TECHNOLOGICAL SOLUTIONS

There is a substantial literature documenting a host of possible solutions to both the groundwater quantity and quality problems. Technological Options Technology, and the money for implementing new and existing technologies, can provide important options for solving local and regional groundwater problems and increasing water use efficiency. Here, four general technological approaches are discussed. However, technological solutions can also cause new problems and conflicts if they are not backed by simultaneous institutional change.

GROUND WATER ISSUES AND SOLUTIONS

Water transfer

The classic solution to water scarcity problems, including those associated with groundwater, has been to increase locally available supply by sourcing from further afield. In terms of groundwater management, imports of new water supplies can be used as a substitute for additional local groundwater use, mitigating problems of drawdown, or as a source of artificial recharge, as discussed in more detail below, Water import is most likely to be physically and economically feasible in urban, rather than agricultural, context because the volumes of water needed are relatively small and the returns to use relatively high,

Increased recharge

A second solution frequently discussed is to increase groundwater supplies not by bringing in water from outside but rather by capturing more locally available water through recharge. Groundwater recharge can be accomplished using a variety of techniques and water sources and with varying levels of complexity. Perhaps ironically, operation of inefficient irrigation systems, which allow surface supplies to seep into the groundwater table is one of the best methods for recharge and plays a major role already in parts of India, Pakistan and elsewhere.

Conjunctive use

Groundwater is often used not as the sole source of irrigation but in conjunction with surface supplies. From an individual farmer's perspective, conjunctive use can be effective because the availability of surface irrigation as well as rainfall) is variable and because groundwater can be used as a buffer to ensure water for crop growth at key times. Conjunctive use can also play a role in improving (irrigation) system or basin water productivity, in particular when there are spatial differences in groundwater quality.

Water-saving technologies and changing use patterns

Even though water imports and recharge can directly increase groundwater supplies, water-saving technologies can raise the productivity of those supplies. A vast range of water-savings technologies is already in existence for both agriculture as well as domestic and industrial use. Most of these technologies are not specifically related to groundwater but rather water use in general. Evidence from both the developed and developing world has shown the effectiveness of these technologies is increasing water productivity measured by the decrease in pumping (or diversions for surface water) necessary to produce a given output.

GROUND WATER ISSUES AND SOLUTIONS

SUMMARY POINTS

1. Aquifers possess multiple properties that make the groundwater they contain highly valuable for a variety of human uses, including the provision of drinking water, irrigation supplies, and a range of environmental services,
2. These properties, coupled with recent expansion of low-cost pumping technologies, have led to an often unrecognized boom in groundwater exploitation in the last few decades, Groundwater now accounts for approximately half of all drinking water supplies and a major portion of all irrigation supplies.
3. The growth in groundwater utilization has brought widespread benefits for global economic development, including urbanization and rural poverty reduction.
4. However, governance mechanisms to manage groundwater use have not kept pace with the changing situation. As a result, while there are still options for expanded use in some regions, quality decline and aquifer depletion are now major issues in many parts of the world.
5. Although a variety of technological options have been identified and applied to improve groundwater outcomes, the open-access nature of the resource and the political economy of water management have limited their success, particularly as related to the largest consuming sector, agriculture.
6. Nonetheless, there is evidence that even where traditional groundwater interventions have failed. Policies based on a broad view of resource systems and human adaption could provide new solutions

FREEZING STEEL

Exposing steel to extremely low temperature (below 190°C) also known as cryogenic treatment has emerged a new strategy in improving steel durability. Exposing steel to extremely low temperatures is carried out by using liquid nitrogen. Cryogenic treatment can improve deterioration resistance and can also help eliminate any pre-existing residual stresses.

Due to the corrosion inhibition effect and compatibility with concrete properties, calcium nitrate solution has been widely used in North America and Asia. However, investigation has often been restricted to tests using a macro cell corrosion monitoring or measuring corrosion rate in an aqueous condition.

The assessment of the inhibition effect of calcium Nitrate based corrosion inhibitory using a polarisation method and its influence on the chloride transport, compressive strength and setting time of concrete was studied.

The calcium Nitrate based corrosion inhibitor significantly reduced the corrosion rate of steel in chloride contaminated mortar and raised the chloride threshold level, ranging from 0.22% to 1.95% by weight of cement, while nitrite-free specimen produced the threshold level ranging from 0.18% to 0.33%.

It was observed that concrete specimens containing the corrosion inhibitor produced the higher total charge passed in a rapid test for chloride ion permeability. An increase in the dosage of corrosion inhibitor resulted in a decrease in the concrete setting time.

ENGINEERING TRENDS

In addition the compressive strength at early ages was increased by corrosion inhibitor, but in a long term (900 days), decreased to that level of 28 days. Cyclic loading can result in severe deterioration in the bond between reinforcing steel bar and the surrounding concrete, especially when the reinforcement is corroded.

Parameters investigated include-corrosion level, confinement, bar type and loading history. The results revealed that bond behaviour was significantly reduced under cyclic loading.

Degradation in bond was significantly less for deformed bars than for smooth bars at the initial loading cycle, but the difference was diminished with loading. The bond reduction was more substantial for unconfined steel bars than for confined bars.

The relatively high level of corrosion caused degradation primarily in the initial five cycles, the effect of corrosion being decreased with loading. It was also demonstrated that the cyclic bond stress-slip curves depended on loading history.

DEPARTMENTAL ACTIVITIES

Seminar on “Capital City Amravati” 15th September 2017

Amaravati is a proposed and planned capital city as the geographical center of location for the Andhra Pradesh state, India. It is being built on a 217 sq km riverfront designed to have 51% of green spaces and 10% of water bodies.

Dr. G V S Raju, Advisor to Chair Person, Amaravati Development Corporation, addressed the gathering. He motivated the students to think beyond the imaginations and to develop ones creativity which is very essential for major developments.



Workshop on Geotechnics for Expansive Soils 18th march 2017

Expansive Soils are most vulnerable in nature. Latest technological advances for better performance of the Expansive Soils are presented for students of 3rd year to enhance their thinking towards research and development.

Dr. A Srirama Rao, Professor in Civil Engineering Department of JNTU Kakinada, Dr. CNV Satyanarayana Reddy, Professor in Civil Engineering Department of Andhra University and Dr. B R Phani Kumar, Professor in Civil Engineering Department addressed the gathering.

DEPARTMENTAL ACTIVITIES

POLLUTION ISSUES-CONSEQUENCES AND REMEDIES

Seminar on “Pollution issues – consequences and remedies” 21st January 2018

Pollution is now a commonplace term, that our ears are attuned to. We hear about the various forms of pollution and read about it through the mass media. Air pollution is one such form that refers to the contamination of the air, irrespective of indoors or outside. A physical, biological or chemical alteration to the air in the atmosphere can be termed as pollution. It occurs when any harmful gases, dust, smoke enters into the atmosphere and makes it difficult for plants, animals, and humans to survive as the air becomes dirty.

Sri Nageswararao, Commissioner BMC and Sri Ansari, member NGO addressed the gathering. They had shared their experience and views with a thought of creating social responsibility and to make students incorporate Environmental Sustainability while designing projects



DEPARTMENTAL ACTIVITIES

LATEST TRENDS IN CIVIL ENGINEERING

Seminar On “Latest Trends in Civil Engineering” 3rd March 2018

Geosynthetics are synthetic products used to stabilize terrain. They are generally polymeric products used to solve civil engineering problems. These products have a wide range of applications and are currently used in many civil, geotechnical, transportation, geoenvironmental, hydraulic, and private development applications including roads, airfields, railroads, embankments, retaining structures, reservoirs, canals, dams, erosion control, sediment control, landfill liners, landfill covers, mining, aquaculture and agriculture..

Dr. CNV Satyanarayana Reddy, Professor in Civil Engineering Department of Andhra University, Dr. B R Phani Kumar, Professor in Civil Engineering Department, Dr. Madhusudhan Reddy, Professor in Civil Engineering Department of S V University, Tirupathi and Dr. A Dalinaidu, Associate Professor in Civil Engineering Department of IIT Madras addressed the gathering



SUPERNOVA-2K18

supernova-2k18 is conducted on jan 5th and 6th of 2018. supernova is a national level technical symposium conducted by civil engineering department in our college.



supernova is our departmental fest starts with the inaugural function.



SUPERNOVA-2K18

all the dignitaries of the college and department and chief guest gave some valuable and adorable messages to the students in the inaugural function.



technical events starts in the afternoon followed by the inaugural function. and the events are:

SUPERNOVA-2K18

- cubicar is an event on preparing a concrete cube with different mix ratios and the best cube (high compressive strength) will be awarded.



- puentes is an event to prepare a bridge with pop sticks and the best (bridge having higher bearing capacity) will be awarded.



- encuesta is surveying contest.

SUPERNOVA-2K18

- elmodelo is an exhibition of models and the best model will be awarded.



- presenticano is a paper presentation challenge and the best presentation will be awarded.



- technodraw
- topografia
- filmora
- davinci

SUPERNOVA-2K18

on the second day after the events completion, the fest ends up with a valedictory function by awarding prizes and certificates to event winners and participants.



the department and all the students are very joyful and exchange their technicality ideas and improve their skills through this symposium. the environment surrounding the department is very colourful with decorations and some environmental pluck cards.





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